

**A model of the relationship between  
leadership styles,  
organisational climate, innovation and performance**

by

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## **ABSTRACT**

Knowledge about the antecedents to and the consequences of innovation is often studied in a fragmented way, resulting in an incomplete understanding of the dynamics that drive organisational performance. The purpose of this study is to develop a comprehensive model explaining the relationship between leadership style, organisational climate, innovation and organisational performance. The systematic literature review procedure was used to identify, analyse and critically evaluate studies that examined the relationship between leadership style, organisational climate, innovation and organisational performance. Given this information as background a cross-sectional survey design was used to test the relationship between the named variables. Firstly, a measurement model was tested with data collected from 3 180 respondents, representing 52 companies. Secondly, a structural path model was tested, with data collected from 231 employees representing 112 companies. The findings of the systematic literature review revealed that empirical studies that link the four variables are scarce; in the main, combinations of three variables are found. It also revealed that measures of innovation and performance vary vastly, inhibiting the incremental development of a comprehensive empirical body of knowledge. The results of the measurement model substantiated differentiation between leadership styles and the expected positive correlation between both transformational and transactional leadership and innovative behaviour. Furthermore, the results showed that not all components of leadership impacted positively on innovative behaviours. The structural path model showed that a transformational leadership style has a direct impact on the organisational climate, innovation and organisational performance. In contrast, a transactional leadership style had a direct impact on organisational performance, but no relationship was found between transactional leadership style and organisational climate and innovation. This study is important as it provides a unified model of innovation that focuses on both antecedents, as well as the outcomes of innovation, in a more comprehensive manner than any previous study.

Keywords: leadership style, innovation, climate, performance, South Africa

## **PREFACE**

The reader should note that the thesis is not presented in the traditional format, which normally includes chapters on orientation, theoretical foundations, literature review, findings and conclusions with recommendations and limitations. This thesis instead follows an adjusted format and rather than applying the traditional format to the whole thesis, the traditional format is applied to each of the research objectives. These research objectives were identified as the study unfolded and presented in Chapter 1.

Each of the objectives was thus approached separately as a conference or academic paper, which included a short introduction, a focused literature review, a short section on methodology and the findings and conclusions. In this way literature and findings on the individual objectives are aligned. In the last chapter, the objectives are brought together again and discussed in an integrated manner, ultimately aligning the individual objectives to the primary objective of the study.

Please note that the presentation and reference style in each chapter differ, as per the prescribed guidelines of the targeted conferences or journals. However, the utmost caution was used to make sure that presentation and reference styles in each chapter are consistent.

The papers relating to all the objectives have been submitted for publication and articles relating to Objectives 1, 2, 3 4, 5, and 8 have been published. The articles relating to Objective 6 has been accepted for publication. The article relating to Objective 7 is still under peer review.

The candidate was responsible for all aspects of the research, including drafting the articles. The supervisor and the co-author provided scholarly guidance and support in structuring this thesis and in preparing all the articles.

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# CHAPTER 1

## ORIENTATION

*The leadership of innovative teams and organisations is perhaps the most confounding mystery in business today.*

Hill, Brandeau, Truelove and Lineback (2014).

This study aims to reduce the confusion about the drivers of innovation and demystifying the role leaders play in fostering innovation in organisations. In this study a model will be presented linking leadership styles, organisational climate, innovation and organisational performance. Most existing models focus on two or three of these constructs. The present study focuses on all four variables, allowing for a more comprehensive understanding of the phenomena. Apart from being comprehensive, this study also focuses on innovation in a developing country, which few studies have addressed in the past.

This chapter begins with a background to the study. The problem statement derives from the background, followed by a statement of the goals and objectives. Thereafter, the importance of achieving these objectives is discussed, followed by the delineation of the research, as well as the limitations experienced. Discussion of the research method follows and includes an explanation of how the literature review was conducted, as well as clarification of how the empirical phase of the study was approached. The chapter concludes with a brief section describing the chapters that follow.

### 1.1 Background

Extensive literature praises innovation as a source of competitive advantage but acknowledges the challenge of establishing a tangible mechanism to connect innovation to overall business performance (Chalhoub, 2010). These challenges can be attributed to the contradictory results of studies that investigated the relationship between innovation and organisational performance. For instance, although the overwhelming majority of studies showed that innovation is significantly and positively related to financial performance (Adegoke, Walumbwa & Myers, 2012; Durán-Vázquez, Lorenzo-Valdés & Moreno-Quezada, 2012; Nybakk and Jenssen, 2012),

others showed no relationship (Drake, Sakkab & Jonash, 2006; Lööf and Heshmati, 2006; Selby, 2010). At the other extreme, some studies showed that organisations that adopted the followers' approach can outperform innovators (Doha, 2012; Koellinger, 2008; Martin, 2012).

Despite the aforementioned contradictory results, the importance of innovation will continue to grow in future as competition increases and as the business environment becomes more and more uncertain (Han, Oh, Im & Chang, 2012). Under these circumstances, organisations will be forced to identify and hire leaders with the ability to foster innovation in the workplace (Stempihar, 2013). This is particularly crucial for organisations operating in the developing countries, which face a rapidly changing external business environment, institutional instability and extreme microeconomic volatility (Farashahi and Hafsi, 2009). In such conditions, top management faces the daunting task of cultivating a strong organisational culture that encourages innovation (Tipu, Ryan & Fantazy, 2012). Through innovation, management is able to ensure that there is a plan to monitor competitors' moves by monitoring customer market intelligence and harnessing the firm's resources (Adegoke, Walumbwa & Myers, 2012).

An increasing number of successful innovations can provide both a challenge and a benefit to an organisation (Golla and Johnson, 2013). The challenges may stem from how best to introduce new products, enhancement of existing products, increased revenue through innovation and ultimately, finding a balance between expenditure on innovation activities and maximizing organisational profit. The benefits for successful innovations include increased revenue and market share and cost reduction by improving operational effectiveness and efficiency (Gunday, Ulusoy, Kilic and Alpkane, 2011; Nybakk and Jenssen, 2012). Perhaps this disparity is the reason why Stempihar (2013) suggests that organisations rarely have leaders with the adequate skills to manage these contradictions effectively to successfully commercialise innovative ideas.

An interesting, if not alarming, phenomenon is that there is no shortage of studies in the literature that investigate the relationship between leadership and innovation; in fact, there is a general consensus amongst scholars that transformational leadership



style is significantly and positively related to organisational creativity and innovation (Al-Husseini and Elbeltagi, 2012; Hu, Gu & Chen, 2012; Tipu *et al.*, 2012).

The leadership style-innovation link is, however, neither simple nor universal. Despite seemingly overwhelming empirical evidence that showed the link between transformational leadership style and organisational innovation, a study conducted by Yang and Chen (2003) found that a transactional leadership style is significantly and positively related to organisational innovation in smaller and less complex organisations. However, transformational leadership style is significantly and positively related to organisational innovation in larger and more complex organisations. These findings indicate that organisational size plays a role in the relationship between leadership styles and innovation.

More recently, Golla and Johnson (2013) conducted a study to examine if a relationship exists between leadership styles (transformational and transactional) and innovation (commitment and output) in commercial software companies. The results revealed a strong statistically significant relationship between transactional leadership style and new products; conversely, the results revealed a strong statistically significant relationship between transformational leadership style and the percentage increase in revenue from innovation. Notably, companies represented in Golla and Johnson's study were relatively small and less complex in nature. These findings further provide evidence that a transactional leadership style is a better predictor of organisational innovation in smaller and less complex organisations.

In contrast, a similar study conducted by Jansen, Vera and Crossan (2009) using branches of large European financial services, indicated that transactional leadership is negatively correlated to radical innovation, whereas transformational leadership is positively related to incremental innovation. The finding of this study suggests that perhaps transactional leadership is not necessarily positively related to innovation in smaller and less complex organisations, but rather related to incremental innovation, which in turn suggests that smaller organisations tend to focus more on incremental innovations.

Also problematic in leadership style-innovation research is the conceptualisation of innovation. Although Golla and Johnson's study did not focus on the nature of

innovation (incremental and radical) when examining the relationship between leadership styles and innovation, their study is significant because the study went a step further by linking leadership and innovation to revenue. The inclusion of revenue is significant because the majority of leadership scholars that investigated the relationship between leadership and innovation do not subscribe to the notion that innovation should ultimately lead to financial success.

For example, Tipu *et al.* (2012) when examining the relationship between transformational leadership style and organisational culture, define innovation as the degree to which an organisation is inclined to achieve a “state on innovativeness”. Similarly Stempihar (2013), when assessing the behaviour of effective leaders in influencing innovative product outcomes, defines innovation as the introduction of novel ideas or methods and turning them into widely used practice. Along the same lines, Yan and Yan (2013) define innovation as the new way of doing things which may lead to old job designs and work relationships. This is not necessarily problematic because it is common knowledge that researchers prefer to define or adopt terms according to their own individual perspective and the phenomena of most interest to them (Yukl, 2010).

The term innovation is defined by the majority of innovation scholars and practitioners as a commercial success achieved from inventions or innovative ideas (Crawford & Di Benedetto, 2006; Kumar, Scheer & Kotler, 2000; Miller, Miller & Dismukes, 2005; Padmorea, Schuetzea & Gibson, 1998; Rogers, 1998; Trott, 2012). In its simplest form (and perhaps this is the most controversial definition), innovation is defined as any profitably commercialisable product, process, or technology that changes society and the way people exist in the world (Miller *et al.*, 2005). Similarly, Crawford and Di Benedetto (2006) define innovation as the overall process whereby an invention is transformed into a commercial product that can be sold profitably. In support of this notion and more recently, Trott (2012) defined innovation as a translation of invention into the economy.

Despite the importance of linking leadership and innovation to organisational performance, measuring innovation is still problematic. This suggests that, although the study by Golla and Johnson (2013) went further to include revenue from innovation output as a measure when examining the relationship between leadership styles and

innovation commitment and output, there is still a challenge to measure accurately the financial benefits derived from innovation activities. In fact, Jansen *et al.* (2009: 15) suggest a need for more future research that links leadership and innovation to organisational performance. However, very few studies have been designed to trace the relationship between these variables (García-Morales, Jiménez-Barrionuevo & Gutiérrez-Gutiérrez, 2012). In the same vein, Denti and Hemlin (2012) after conducting an extensive theoretical review on the studies that investigate the relationship between leadership and innovation suggested future research to investigate leadership styles and the nature of innovation (incremental and radical).

Also problematic is the measure of organisational performance. Despite the broad general consensus amongst innovation scholars on the definition of innovation, the debate around the key measures of financial performance has not reached a conclusion (Garg, Joubert & Pellissier, 2004). Some scholars use growth as a sole measure, whereas others prefer to use a combination of both growth and profitability (Cho and Pucik, 2005). Scholars using profitability as a measure of financial performance have used a variety of measures, which include return on sales (ROS), return on assets (ROA), return on equity (ROE) and return on investments (ROI). The other popular measures of financial performance for innovation outputs include market related ratios such as price earnings (P/E), market-to-book and Tobin's Q (Cho & Pucik, 2005; Selby, 2010).

Accounting-based measures are useful because they provide an objective performance measure (Campbell & Mínguez-Vera, 2008). However, this creates a challenge in measuring innovation success because the international financial reporting standard (IFRS) does not handle innovation-related expenditure adequately (Frigo, 2003; Smith, 2007). The problem is that the IFRS enforces the immediate expense on innovation activities to be recorded. This creates a challenge because of the time lag between innovation expenditures and their effect on financial performance, estimated to be three to twelve years (Boonzaaier, 2009; O'Connor, Leifer, Paulson & Peters, 2008). This leads to a situation in which the innovation expenditure measured against the product will only emerge a few years later (Selby, 2010).

Moreover, it is important to note that organisational performance can be subjective or objective. Objective measures are the absolute values of a firm's actual performance (Battor and Battor, 2010), whereas subjective measures generally refer to the researcher asking respondents to assess their company's performance relative to their competitors (Greenly, 1995). Although the use of both subjective and objective measures is considered to be the most appropriate approach to assess organisational performance, a preliminary literature search reveals that most scholars prefer to use subjective measures of organisational performance (Zhou, Hong & Liu, 2013; Nawaz, Hassan & Shaukat, 2014; Yang, Yang & Chen, 2014). The use of either subjective or objective measures is not necessarily wrong, provided the researcher clearly defines which aspect of organisational performance they intend to study (Gentry and Shen, 2010).

Understanding the relationship between leadership style, innovation and organisational performance without other antecedents of innovation can be problematic as well. It is important to acknowledge that effective innovation is inextricably linked to various dimensions that go beyond leadership, including, amongst others, organisational climate (Michaelis, Stegmaier & Sonntag, 2010). Organisational climate is a broad concept, which provides a platform for employees to participate in decision-making, the provision of a good working environment and creating a suitable career ladder for employees (Padmaja, 2014). In fact, Shanker, Bhunugopan and Fish (2012) argue that encouraging a climate conducive for innovation is likely to be a key differentiator for organisations wanting to be industry leaders. Using a meta-analysis of 42 studies, Hunter *et al.* (2007) reaffirm this argument by demonstrating that the organisational climate produces a significant effect in developing a culture conducive to innovation.

Despite the importance of the aforementioned relationship (leadership, organisational climate, innovation and organisational performance), organisations may fail to achieve sustainable competitive advantage due to a lack of understanding of the nature of the relationship between these strategic variables.

## 1.2 Problem statement

The problem statement is grounded in the aforementioned background. Firstly, only a few studies are designed to trace the causal path between leadership style, innovation and organisational performance.

Secondly, none of the model developed that link these variables (leadership style, innovation and organisational performance) considers the influence of a climate that is conducive for innovation, despite the importance of organisational climate in the relationship between these constructs.

Thirdly, through the literature review it become evident that it is not known which style of leadership is appropriate when the goal of the organisation is to create new and novel products (that is, radical innovation) or when the goal is to expand and refine existing products (that is, incremental innovation). Leaders and academics are thus ill informed as to which strategy to follow when the goal is to create novel or to refine existing products.

Fourthly, very few studies use objective measures of financial performance when assessing the impact of innovation on organisational performance. Subjective measures of organisational performance were used in most of the studies accessed, and as such it is important to affirm that the same results are likely to yield when the objective measures are used.

The above information is absent for organisations operating in developing countries, which face a rapidly changing external business environment, institutional instability and extreme microeconomic volatility.

*The **problem** is that if the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance is not clearly understood, then effective processes cannot be put in place by organisational leaders to optimise organisational performance.*

### 1.3 Goals and objectives

Given the research problem presented in the previous section, the following goals and objectives were formulated.

The primary goal of this study is to develop a comprehensive model explaining the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance.

The secondary goals achieved were summarised into three distinct phases:

**Phase 1:** To consolidate prior scientific studies that investigated the relationship between leadership style, organisational climate, innovation and organisational performance. This would result in identifying possible gaps in the current body of knowledge.

**Phase 2:** To systematically develop and empirically test a model explaining the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance using perceived data from employees.

**Phase 3:** To validate a model explaining the relationship between innovation and organisational performance using objective measures of organisational performance collected from publicly published financial data.

In practice the phases of the research resulted in eight objectives being achieved. In Phase 1 the existing scientific knowledge that investigated the relationship between leadership style, innovation and organisational performance was examined (Objective 1, Chapter 2), followed immediately by an examination of existing scientific knowledge that investigated the relationship between organisational climate, innovation and organisational performance (Objective 2, Chapter 3). Phase 1 concluded by examining the methods used on studies identified in Objectives 1 and 2 (Objective 3, Chapter 4). However, after examining the method used, two major gaps were identified.

Firstly, the concern was that none of the studies examined differentiate between radical and incremental innovation. Secondly, very few studies used an objective measure of organisational performance.

Thus, to gain better understanding of the dynamics of these constructs, two further objectives were incorporated. The first objective relates to the investigation of the psychometric instrument used to measure radical and incremental innovation on prior studies that differentiated between these types of innovation (Objective 4, Chapter 5). Thereafter, the instruments most frequently used to measure organisational performance when investigating the relationship between innovation and organisational performance are examined (Objective 5, Chapter 6). This concludes Phase 1 of the study objectives.

Given the aforementioned background, developing of the model explaining leadership style, climate, innovation and performance (Phase 2 objectives) was possible. To test the model, two empirical studies were conducted. Firstly, a simple model linking components of leadership styles and innovative behaviour was tested (Objective 6, Chapter 7). Secondly, a model explaining leadership styles, organisational climate, innovation and *perceived* organisational performance was proposed and tested (Objective 7, Chapter 8). To support the model developed in Objective 7 an additional empirical study was conducted linking innovation with *objective* measures of organisational performance (Phase 3 objective). This link was indeed established (Objective 8, Chapter 9).

#### **1.4 Importance of the study**

A systematic literature review and three building blocks of science were adopted as a structure to report on the relationship between leadership styles, organisational climate, innovation and organisational performance. This was a novel approach and the research makes a significant contribution to the body of knowledge as the strategy made it possible to identify common practices as well as gaps in the existing body of knowledge.

This study extends the existing fragmented models on innovation to a more comprehensive model on the relationship between leadership style, innovation, organisational climate and performance. From a business perspective, a lack of adequate understanding of the influence of leadership styles and organisational climate on the relationship between innovation and organisational performance or awareness of perceptions pertaining to the matter could pose a serious problem.

Although innovation is widely regarded as a critical component of sustainable competitive advantage and there is general consensus that leadership style appears to influence innovation in most industries, the two streams of research (leadership and innovation on one hand and innovation and organisational performance on the other) remain separated from one another (Amar, Hentrich & Hlupic, 2009; Zona, 2009).

Analysing all three variables in one comprehensive study provided managers with a better understanding about which leadership style is more effective when the objective is to improve organisational performance utilising innovation as an enabler to facilitate the process. Furthermore, investigating leadership styles at a component level will provide managers with a better understanding about which elements of leadership are more effective in driving innovation. Such an analysis provided valuable information to managers on where exactly to focus their efforts on promoting innovative behaviour within the organisation.

The study is also important as it includes organisational climate as a variable in the aforementioned equation. The inclusion of organisational climate when investigating the relationship between leadership style, innovation and organisational performance could provide more insight on how the work environment is associated with innovation. Thus, the inclusion of organisational climate when investigating the relationship between leadership style, innovation and organisational performance could provide valuable insight for managers on the leadership style-organisational climate relationship, as well as its effects on innovation and organisational performance. In this way this research makes an important contribution to the body of knowledge by presenting a more complex and comprehensive model by linking all the aforementioned variables. This model will have practical implications and managers will be able to gain insights into how the processes and particular practices influence the final outcome.

The study also makes a further contribution to the innovation debate as it differentiates between radical and incremental innovation when considering the leadership style. Prior studies that investigated the leadership-innovations relationship did not analyse whether a different style of leadership is required for different types of innovation. For instance, the current literature does not provide information on which leadership style



is required when the aim is to improve incremental innovation or when the aim is to increase radical innovation in the organisation.

In this research such an analysis was performed. This type of analysis could be a source of information on the fit or misfit between leadership styles and the type of innovation the organisation is targeting. Furthermore, this analysis could also provide managers with information on which components of the leadership style are required and at what stage in the innovation process.

This study provides a perspective from developing countries. The current body of knowledge on leadership, organisational climate, innovation and organisational performance is informed mainly by studies conducted in the western world, and findings from such studies cannot be applied to organisations operating in the emerging markets, such as South Africa. As such, this study contextualises the existing academic knowledge on leadership style, organisational climate, innovation and organisational performance. It provides leaders in South Africa and other developing countries with new insights into the relationship between these constructs.

## **1.5 Delineation**

The literature included in this study was limited to literature within the academic domain. This delineation was informed by Morrison (2003), who argues that the one foremost measure that a doctoral degree is judged on is whether an adequate, significant contribution has been made to the existing scientific body of knowledge.

The empirical research was conducted using data collected in South Africa for operational reasons. Thus the nature of the relationship between the above-mentioned constructs is addressed in the South African situation, focusing on South African culture and practices. Nonetheless, the results may possibly be generalised to other countries with the same environmental characteristics.

The study focuses on four variables only. It is acknowledged that other variables that contribute to innovation and organisational performance, such as strategy, people and knowledge management, are not included. The study was delineated as including more variables would be too taxing for respondents and may lead to respondent answering questionnaires in an inconsiderate manner. The selected variables were

however carefully selected, informed by the literature, which suggests that the selected variables have a significant and prominent relationship with innovation.

## **1.6 Limitations**

The first limitation relates to the sample. The companies involved in the study were self-selected. Although this presents a limitation, the 112 companies included nevertheless represent a large number of companies, more so than are included in other studies.

A further limitation is the fact that a large portion of the data reported is self-report data for organisational performance. This was mentioned as a limitation in other studies as well. In this study an effort was made to minimise this limitation by testing the innovation-performance hypothesis using financial data from publicly published annual financial reports.

Focusing on only four variables also presented a limitation. As stated in the section on delineation, other variables such as strategy, people and knowledge management could have been included. This study however presented a model more complex than the models found in the consulted literature.

## **1.7 Research method**

The research consists of the literature review and the empirical investigation. The method followed for each are presented below.

### **1.7.1 Literature review**

The objective as described in **Phase 1** was to consolidate prior scientific studies that investigated the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance.

To identify the articles used in prior studies, a systematic review and the three building blocks of science (concepts, statements and conceptual framework) was followed. To analyse and synthesise the current body of knowledge, the three building blocks and the thematic review were adopted. Secondly, the research methodology framework (research paradigm, research design, sampling, instruments, validity and reliability,

limitations and ethical considerations) was followed to gain an insight on the methodology adopted on prior studies that investigated this relationship.

### **1.7.2 Empirical investigation**

The objective as described in **Phase 2** is to develop and empirically test the model explaining the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance using perceived data from respondents. Two datasets were collected to achieve this objective.

With the first dataset the objective was to gain a better understanding of the components of transformational and transactional leadership styles and innovative behaviour.

Data was collected from 3,180 employees in 52 South African companies. The Multifactor Leadership Questionnaire (MLQ-FORM 6S) developed by Avolio, Bass and Jung (1995) was used to measure leadership styles. This is a self-report measure containing 21 items, grouped into seven factors, four representing transformational leadership (idealised influence, inspirational motivation, intellectual stimulation and individual consideration), two being constructs for transactional leadership (contingent reward and management-by-exception) and one construct being for laissez-faire. Eight-item questionnaires on innovative behaviour were developed to assess the extent to which individuals characterise the ideas they generate at work. Correlation and regression analysis were used to examine the nature of the relationship between leadership styles and innovative behaviour.

With the second dataset the objective was to develop and test a model explaining leadership styles, organisational climate, innovation and perceived organisational performance. The target respondents in this study were managers who had a close proximity to the leader of the organisation. In total, 146 respondents returned acceptably completed questionnaires. The acceptable questionnaires represented 121 companies in South Africa. Data was collected on the leadership style of the CEO, the climate for innovation in the organisation, the respondents' own innovative behaviour and the perceived organisational performance.

To assess leadership styles, the Multifactor Leadership Questionnaire (MLQ-FORM 6S) developed by Avolio, Bass and Jung (1995) was used. For the measurement of organisational climate, the six-dimension scale developed by Amabile, Conti, Coon, Lazenby and Herron (1996) was used. To measure radical and incremental innovation, the scale developed by Gilson, Lim, Innocenzo and Moye (2012) was adopted. Organisational performance was measured with the custom developed three-item measure to assess perceived overall performance relative to competitors or organisations with similar services. The three-item measure assessed customer satisfaction, productivity and product/service innovation relative to competitors. Correlations and Structural Equation Modelling (SEM) analysis was used to test the model on the relationship between leadership styles, organisational climate, innovation and perceived organisational performance.

The objective as described in **Phase 3** was to validate the relationship between innovation and organisational performance using objective measures of organisational performance collected from publicly published financial data from the stock exchange. Secondary data from the Innovation Agency regarding innovation in South African banking was used. With regard to organisational performance, financial data was collected from INET BFA (from 2007 to 2014) for comparison purposes. INET BFA provides real-time information and historical financial and company information on South African listed companies. Following previous studies, the two most popular accounting-based measures (ROE and ROA) and market-based measures (P/E), were used as a proxy for organisational performance. A descriptive analysis was conducted as part of the exploratory approach to analyse the data. The non-parametric Kruskal-Wallis and Mann-Whitney U tests were used to analyse the financial performance of the banks.

The aforementioned method was used to develop and evaluate a comprehensive model of the relationship between leadership style, climate, innovation and organisational performance.

## **1.8 Chapter divisions**

The chapter division is summarized in Table 1 below.

Table 1: Chapter division summary

Introduction	
Chapter 1	Presents the background to the study, problem statement, goals and objectives as well as stating the importance of the study. The chapter concludes by delineating the limitations of the study and the research method adopted.
Literature Review	
Chapter 2	Consolidates the published scientific knowledge of the impact of leadership style on the relationship between innovation and organisational performance.
Chapter 3	Consolidates, synthesizes and critiques the empirical studies that have examined the relationship between organisational climate, innovation and organisational performance.
Research Methodology	
Chapter 4	Reports on the method used in empirical studies that investigated the relationship between leadership styles, innovation and performance on the one side, and organisational climate, innovation and performance on the other.
Chapter 5	Examines the psychometric instrument used to measure radical and incremental innovation on prior studies that differentiated between these natures of innovation.
Chapter 6	Examines the most frequently used instruments in the measurement of organisational performance when investigating the relationship between innovation and organisational performance.
Empirical Study	
Chapter 7	Examines the effect of transformational and transactional leadership styles as well as the effect of each component of transformational and transactional leadership on innovative behaviour.
Chapter 8	Develops a comprehensive model explaining the nature of the relationship between leadership styles, organisational climate, innovation and organisational performance.
Chapter 9	Analyses the top five retail banks in South Africa and distinguishes between innovative banks and fast-follower banks. Tests whether innovative banks exhibit superior financial performance relative to fast-follower banks, using the objective measures of financial performance.
Conclusion	
Chapter 10	Presents the conclusion, based on the results of the literature review and empirical investigation, followed by a discussion on the limitations of the study. Lastly, recommendations are made, directed first towards the researchers, and then towards leadership and innovation practitioners.

Achieving the above objectives will fill the void in the current body of knowledge and practically capture the essence of how leaders can foster innovation and unleash the full creative potential of their organisations, ultimately sustaining competitive advantage.

## **CHAPTER 2**

### **OBJECTIVE 1**

In this chapter, the first of the eight objectives is presented. The objective of this chapter is to consolidate the published scientific knowledge relating to the impact of leadership styles on the relationship between innovation and organisational performance. The title of the article, as published at the South African Journal of Economic and Management Sciences, is "*The relationship between leadership style, innovation and organisational performance: A systematic review*". The format presented in this chapter is in line with the guidelines for authors published by the journal. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **The relationship between leadership styles, innovation and organisational performance: A systematic review**

## **Abstract**

This paper is an attempt to consolidate the published scientific knowledge about the impact of leadership styles on the relationship between innovation and organisational performance. Concepts, statements and conceptual frameworks were used as structure to analyse the body of scientific knowledge. After consulting 31 major research databases using the systematic literature review methodology, only seven journals articles that examined the link between leadership, innovation and organisational performance were identified. The synthesis of the journal articles revealed (a) that consensus exists among researchers as far as the relevant concepts are concerned; (b) that most agree on the definition of leadership and innovation but that a uniform understanding of what constitutes organisational performance is lacking; and (c) that conceptual models are too simplistic and do not consider mediator variables or multiple financial criteria measures. The findings further reveal that innovation is significantly and positively related to superior organisational performance, and that, although transformational leadership style is significantly and positively related to innovation, transactional leadership style is more appropriate when the aim is to instil a culture of innovation. Transformational leadership style, by contrast, is mostly associated with organisational performance. In addition, the findings further reveal that none of the studies investigate the mediating effect of the nature of innovation (incremental and radical) on the relationship between leadership and organisational performance, and that none of the studies use the objective measures of financial performance such as ROA, ROE, price/earnings (P/E) and Tobin's Q calculated from annual financial reports.

**Keywords:** transformational leadership, transactional leadership, organisational innovation, organisational performance, systematic review

## **Introduction**

Innovation is broadly seen as an essential component for competitiveness and survival, embedded in organisational structures, processes, products, and services within the organisation (Gunday et al., 2011). As a result, innovation is considered by many scholars as one of the most important determinants of firm performance (Adegoke, Walumbwa, & Myers, 2012, Durán-Vázquez, Lorenzo-Valdés, & Moreno-Quezada, 2012, Grant, 2012). According to García-Morales, Matías-Reche, & Hurtado-Torres (2008), leadership style has been recognised as one of the most important factors influencing the relationship between innovation and organisational performance, because leaders have the authority to set specific goals and encourage innovative initiatives from subordinates.

There is no shortage of documented studies in the literature that investigate the relationship between leadership and innovation. The general consensus among scholars is that transformational leadership style is significantly and positively related to organisational creativity and innovation (Al-Husseini & Elbeltagi, 2012, Hu, Gu, & Chen, 2011, Tipu, Ryan, & Fantazy, 2012). On the other hand, several studies (Adegoke et al., 2012, Nybakk & Jenssen, 2012, Durán-Vázquez et al., 2012) show that innovation is positively related to superior financial performance. Although some studies show no relationship (Selby, 2010, Lööf & Heshmati, 2006, Kandybin & Kihn, 2004), others show mixed results with non-innovative firms outperforming innovators in some instances (Martin, 2012, Forsman & Temel, 2011, Kannebley, Sekkel, & Araújo, 2008).

However, despite this overwhelming empirical evidence showing the link between leadership style and innovation on the one hand, innovation, and financial performance on the other, very few studies have been designed to trace systematically the causal path of the effect of innovation on financial performance by examining the influence of leadership style. Therefore, the purpose of this paper is to review systematically the state of research on the relationship of these strategic variables, namely, leadership style, innovation and organisational performance.



## Literature review

A systematic review is a process for reviewing relevant literature using a comprehensive, pre-planned strategy to locate existing literature, evaluate its contribution, analyse and synthesise findings and report on evidence to allow conclusions to be reached about what is known and what is not (Denyer & Tranfield, 2009). Originating in the medical sciences, a systematic review differs from conversational reviews in that it aims at synthesising research in a systematic, transparent and reproducible manner (Tranfield, Denyer, & Smart, 2003). According to Robson et al. (2007), a systematic literature review uses explicit, thorough methods to identify, select, appraise and synthesise a set of research studies on a well-defined topic.

In management research, a literature review process is a key tool used to manage the diversity of knowledge for a specific enquiry (Robson et al., 2007). Thus, the primary purpose of a literature review is: (1) to identify knowledge gaps and develop a research problem; (2) to identify the appropriate theoretical framework, issues and variables related to a particular research topic; and (3) to find conceptual and operational definitions and the appropriate methodologies for investigation (Kaniki, 2009).

On the other hand, theory building is an essential process in the development of new knowledge (Morrison, 2003). Conceptually, knowledge can be seen as the result of three courses of action; namely, the creation of new theories; the expansion of existing theory; and the disconfirmation of theories that do not survive empirical scrutiny (Handfield & Melnyk, 1998). Therefore, knowledge is not simply a matter of content, but the capacity of content to bring about effective actions (Morrison, 2003).

Perhaps it is in this context that Reynolds (1971) posits that a scientific body of knowledge consists of concepts and statements that scientists consider to be useful for achieving the purposes of science. Advancing the same argument and building on the seminal work of Mouton (1996) and Kerlinger and Lee (2000), De Vos, Strydom, Fouché and Delport (2011) present the three building blocks of science, namely, concepts, statements and conceptual frameworks.

- The Oxford Dictionary defines the term “concept” as “an idea or principle that is connected with the abstract” (Hornby, 2000:234). A more generalised definition put

forward by Omar and Leite (1998:3) is a “specific classification based in common attributes of objects, people, events, phenomena, instances or specific ideas”. Concepts act as the carriers of meaning; in other words, they enable researchers to identify and refer to a social phenomenon and as such, one could argue that concepts are the symbolic constructions by means of which people make sense of the attributive meaning of their words (Mouton, 1996). Thus, possession, understanding and use of concepts by researchers are the most basic requirements of scientific enquiry (De Vos et al., 2011).

- Statements, on the other hand, include definitions, hypotheses and propositions (De Vos et al., 2011). According to Mouton (1996) a definition is a statement that delimits or demarcates the meaning of a word in terms of its sense or reference. However, it is worth mentioning that there are two distinctive types of definitions; namely, theoretical (connotative) and operational (denotative) definitions. A theoretical definition refers to the specification of the meaning of the connotative meaning of a concept, whereas an operational definition describes certain operations, usually some type of measurement, under which the use of the concept is valid.

Along the same lines, a hypothesis is an expectation about the nature of things derived from theory and is a statement of something that should be observed in the real world if the theory is correct (De Vos et al., 2011). As a result, an empirical hypothesis is an information item that becomes transformed into new observations via interpretation of the hypothesis into observables, instrumentation, scaling and sampling (Handfield & Melnyk, 1998). The observable units in this context refer to variables (entities which are capable of assuming two or more values) which can be operationalised empirically by measurements (Bacharach, 1989).

In contrast, a proposition is a statement which contains testable claims (Mouton, 1996). At an abstract level, a proposition states the relationship between constructs (Bacharach, 1989). The primary difference between propositions and hypotheses is that propositions involve concepts, whereas hypotheses require measures (Whetten, 1989). In other words, although propositions and hypotheses are merely statements of relationships, propositions are the more abstract and encompassing of the two. Propositions relate the more abstract constructs to one another, whereas hypotheses are more concrete operational statements built from specific variables (Bacharach, 1989).

- Conceptual framework typically includes typologies, models, theories and paradigms (De Vos et al., 2011). According to Mouton (1996), typology can be defined as a conceptual framework in which phenomena are classified in terms of characteristics that they have in common with other phenomena. Capecchi (1968) defines typology, in its simplest form, as a selection of a certain number of combinations of groups of variables. This selection may be based on the data afforded by empirical research. Thus, a typology presents a static image or cross-section of a specific class of events (Mouton, 1996).

Conversely, a model is defined as a representation of reality (De Vos et al., 2011). In an attempt to simplify the term “model”, Whetten (1989) presents an interesting analogy by suggesting that if we think of theory as a story about why, then a model can be properly viewed as a visual aid that helps storytellers highlight the main features of their explanations. However, it is worth mentioning that a model does not necessarily equate to theory. According to Kerlinger and Lee (2000), a theory is a set of interrelated constructs (concepts), definitions and propositions that present a systematic review of the phenomena by specifying relations about the variables, with the purpose of explaining and predicting a phenomenon. As Bacharach (1989) points out, the primary purpose of theory (theoretical statements) is to organise “parsimoniously” and to communicate “clearly”.

When the researcher embarks on a process of organising and communicating or explaining unknown phenomena, the research paradigm plays an important role. According to De Vos et al. (2011), a paradigm is a general framework for looking at life, and as such, influencing how the researcher views and interprets material about reality and guiding the consequent action to be taken. Therefore, this paper will follow the three building blocks of science (concepts, statements and conceptual framework) to review the state of research that investigates the relationship between leadership style, innovation and organisational performance.

## **Methodology**

While systematic reviews are designed to reduce bias, a full operational protocol should be written to define and guide the search process (White & Schmidt, 2005). Hence, the systematic review methodology has been developed to minimise the effect of selection, publication and data extraction bias (Nightingale, 2009). According to

Nightingale (2009) the methodology of the systematic literature review should clearly state the aims and objectives of the review, the inclusion and exclusion criteria for studies, the way studies are identified, and the plan of the analysis. In this way, the systematic review helps to develop a reliable knowledge base by accumulating knowledge from a range of studies (Tranfield et al., 2003). Given this purpose, clear guidelines should determine which research should be included and excluded in the final analysis (Green et al., 2006). Moreover, it is worth noting that the decision pertaining to inclusion and exclusion remains relatively subjective. Thus, to increase reliability, it is recommended that this stage of the systematic review should be conducted by more than one reviewer (Tranfield et al., 2003).

### Literature search

To enhance the reliability of the present research, two researchers (the author and co-author) were involved in the literature search. The primary aim of this systematic review was to analyse prior studies that investigate the relationship between leadership, innovation and organisational performance, and to identify emergent themes based on the building blocks of science presented in the literature review. The keywords “leadership” (leaders\*), “innovation” (innov\*) and “performance” (perform\*) were used in the search. As the keywords “creativity” (creative\*) and innovation are occasionally used interchangeably in the literature, these were also included. Similarly, the keywords “financial” (financ\*), “output” (outp\*), and “return on investment” (return\*) were used because they are occasionally used interchangeably with “performance”. The options (criteria) selected for the search were full text, peer-reviewed and scholarly journals. Target articles needed to include all three keywords in a title.

With no time limit set, 21 databases (Africa-Wide Information, Business Source Complete, CAB Abstracts, Communication & Mass Media Complete, Communication Abstracts, eBook Collection (EBSCOhost), EconLit with Full Text, Education Source, ERIC, Humanities & Social Sciences Index Retrospective: 1907–1984 (H.W. Wilson), Humanities Source, Library & Information Science Source, Library, Information Science & Technology Abstracts, MasterFILE Premier, PsycARTICLES, PsycBOOKS, PsycCRITIQUES, PsycEXTRA, PsycINFO, Regional Business News, Social Work Abstracts, SocINDEX) were searched on EBSCOhost and 13 articles were retrieved.

Again, no time limit was set on a search of ten databases (Applied Social Sciences Index and Abstracts (ASSIA) (1987-current) information, COS Scholar Universe information, ebrary® e-books information, ERIC (1966-current) information, Library and Information Science Abstracts (LISA) (1969-current) information, PAIS International (1914-current) information, ProQuest Business Collection (1951-current) information, ProQuest Central (1971-current) information, Social Services Abstracts (1979-current) information, Sociological Abstracts (1952-current) information) on ProQuest, which resulted in ten articles being retrieved. In total 23 articles were retrieved from both EBSCOhost and ProQuest. However, six duplicate articles were identified, resulting in 17 distinct articles retrieved from the search.

The abstracts of the articles which met the first level of inclusion criteria were analysed in order to identify those articles that (1) use financial performance as a measure of organisational performance; (2) are published in English; and (3) treat leadership style, innovation and performance as variables. Seven articles (presented in Table 1) met these criteria.

Table 1: Articles that investigate leadership styles, innovation and organisational performance

Article	Year	Author (s)	Title	Journal
1	1993	Howell & Avolio	Transformational leadership, transactional leadership, locus of control and support for innovation: key predictors of consolidated-business-unit performance	Journal of Applied Psychology
2	2008	García-Morales, Lloréns-Montes & Verdú-Jove	The effects of transformational leadership on organizational performance through knowledge and innovation	British Journal of Management
3	2008	García-Morales, Matías-Reche & Hurtado-Torres	Influence of transformational leadership on organizational innovation and performance depending on the level of organizational learning in the pharmaceutical sector	Journal of Organizational Change Management
4	2008	Matzler, Kepler, Deutinger & Harms	The relationship between transformational leadership, product innovation and performance in SMEs	Journal of Small Business and Entrepreneurship
5	2012	Overstreet, Hanna, Byrd, Cegielski & Hazen	Leadership style and organizational innovativeness drive motor carriers toward sustained performance	The International Journal of Logistics Management
6	2013	Noruzi, Dalfard, Azhdari, Nazari-Shirkouhi & Rezazadeh	Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an	International Journal of Advanced Technology

Article	Year	Author (s)	Title	Journal
			empirical investigation of manufacturing firms	
7	2013	Golla & Johnson	The relationship between transformational and transactional leadership styles and innovation commitment and output at commercial software companies	The Business Review, Cambridge

## Findings

From Table 1 it is clear that only seven articles retrieved investigate the relationship between leadership styles, innovation and organisational performance. These findings illustrate that there is a lack of research that investigates the link between leadership, innovation and corporate performance. However there is no shortage of studies that investigate the relationship between these strategic variables. When the keywords “leadership” (leader\*) and “innovation” (innov\*) were used, 377 articles from EBSCOhost and 161 articles from ProQuest were retrieved. Similarly, when the keywords “innovation” (innov\*), and “performance” (perform\*) were used in the search strategy, 843 articles were retrieved from EBSCOhost and 361 articles from ProQuest.

From the obtained sample of seven articles, five articles focus specifically on transformational leadership style, whereas two articles investigate both transformational and transactional leadership styles. Of the seven articles, one is more than ten years old, while the others were published in the last eight years. The seven articles that explicitly investigate the relationship between leadership style, innovation and organisational performance were analysed according to the three building blocks of science (concepts, statements and conceptual frameworks) identified by De Vos et al. (2011).

## Concepts

The words that appear in the keywords list are classified as concepts. However, only three of the seven articles list keywords. The most common keywords that appear in the three articles are “transformational leadership” and “organisational performance”. Other keywords are “organisational learning”, “knowledge management”, “organisational innovation”, “manufacturing firms”, “pharmaceuticals industry”, “innovation”, “supply chain management”, “dynamic capabilities”, “organisational

innovativeness”, “transportation”, “survey methods”, and “structural equation modelling”.

### Statements

As stated in the literature review, statements include definitions, hypotheses and propositions.

### *Definitions*

The most common words/terms and phrases defined are “transformational leadership”, “innovation”, “organisational innovation” and “organisational performance”. Other definitions included in these articles are those of “knowledge slack”, “leadership”, “organisational innovativeness”, “innovativeness”, “innovation commitment”, “innovation output”, “innovation strategy alignment”, “percentage of expenses allocated to innovation”, “percentage of revenue allocated to innovation”, “transactional leadership” and “theoretical framework”. However, for the purpose of this paper, the focus is on the three variables under investigation; namely, leadership styles, innovation and organisational performance.

- *Leadership styles:* The articles mention transformational and transactional leadership styles. According to Howell and Avolio (1993) transformational leaders are leaders that focus their “efforts on long term goals, place value and emphasis on developing a vision and inspiring followers to pursue the vision, change or align systems to accommodate their vision rather than work within the existing systems, and coach followers to take a greater responsibility for their own development, as well as the development of others”. Along similar lines, García-Morales et al. (2008) define transformational leaders as leaders who can influence the fundamental attitudes and assumptions of an organisation’s members by creating a common mentality to attain the firm’s goal. Similarly, García-Morales et al. (2008) define transformational leadership as the style of leadership that heightens consciousness by the organisation’s members of a collective interest and helps them to achieve it. More recently, Noruzy et al. (2013) define transformational leadership generically as a managerial style that seeks to inspire employees by charismatic speeches, motivation, and intellectual stimulation. In the same vein, Golla and Johnson (2013) define transformational leadership based on four

components; namely, influence/charisma, inspiration, intellectual stimulation and individualised consideration. Only two articles investigate the influence of transactional leadership on the relationship between innovation and organisational performance. Howell and Avolio (1993) describe transactional leadership as a leadership style in which a leader-follower relationship is based on a series of exchanges or bargains between leaders and followers. Similarly, Golla and Johnson (2013) define transactional leadership as a style of leadership that focuses on individual self-interest and motivates individuals through rewards.

- *Innovation*: Only four of the seven articles define the terms “innovation” and “innovativeness”. García-Morales et al. (2008) adopt the innovation definition formulated by the Product Development and Management Association (PDMA), which describes innovation as a new idea, method or device, or an act of creating a new product, service or process. Similarly, Golla and Johnson (2013) adopt the term “innovation” in relation to product and define product innovation as the market introduction of new goods or a significantly good service with respect to its capabilities, such as quality, user friendliness, software or subsystems. Conversely, Overstreet, Hanna, Byrd, Cegielski and Hazen (2013) opt for the term “innovativeness” rather than “innovation” and describe innovativeness as the propensity of an organisation to deviate from conventional industry practices by creating or adopting new products, processes or systems.
- *Organisational performance*: An interesting finding is that only one (Overstreet et al., 2013) of the seven articles that investigate the relationship between leadership, innovation and organisation performance attempts to define organisational performance. According to Overstreet et al. (2013) organisational performance can be measured using two distinct but related constructs; namely, operational and financial performance. According to them, operational performance refers to the firm’s ability to efficiently and effectively provide services to the customer, whereas financial performance includes, among others, profitability and monetary measures such as return on investment, return on sales and operating ratios. Although other studies do not explicitly define organisational performance, attempts were made to show how organisational performance is measured. For instance, Golla and Johnson (2013) use the combination of innovation commitment and innovation output as a proxy for organisational performance. They calculate organisational



performance as the difference between innovation output and innovation commitment. Innovation commitment is calculated as a percentage of expenses allocated towards innovation and innovation strategy, whereas innovation output is calculated as a percentage of revenue related to innovation and the number of new or enhanced products.

### *Hypotheses, propositions and truth statements*

In the seven articles identified, a total of 54 hypotheses are postulated and tested. However, of the 54 hypotheses tested, only 26 investigate the link between leadership style, innovation and organisational performance. 11 hypotheses test the relationship between leadership style and organisational performance; nine hypotheses test the relationship between leadership style and organisational innovation, and six hypotheses test the relationship between organisational innovation and organisational performance. Other hypotheses test mediating effects such as locus of control, knowledge slack, absorptive capacity, organisational learning, tacitness, size and knowledge management on the relationship between leadership style, innovation and organisational performance.

No phrases resembling propositions were found. However, the tested hypotheses provide many truth statements. The results reveal overwhelming evidence that transformational leadership style is positively associated with innovation, and in turn, innovation is positively associated with organisational performance (García-Morales et al., 2008, García-Morales et al., 2008, Matzler et al., 2008, Overstreet et al., 2013, Noruzy et al., 2013). Of the 11 hypotheses which suggest a relationship between leadership style and organisational performance, nine hypotheses postulate a positive relationship between transformational leadership and organisational performance, and all hypotheses are supported by empirical findings. Of the 11 hypotheses that test the relationship between leadership style and organisational performance, two hypotheses postulate that there is a positive relationship between transactional leadership and organisational performance. Both these hypotheses were rejected, indicating that there is no relationship between transactional leadership and organisational performance. Eight hypotheses test whether a positive relationship exists between transformational leadership and organisational innovation or innovativeness, and the results reveal mixed results, with the overwhelming majority

(seven) of the hypotheses supported, although one hypothesis test was rejected. Interestingly enough, the studies that show no relationship between transformational leadership and organisational innovation also reveal a statistically significant positive relationship between transactional leadership and organisational innovation (Golla & Johnson, 2013). The six hypotheses that postulate a positive relationship between organisational innovation and organisational performance are supported by the data.

### Conceptual frameworks

As described in the literature review, a conceptual framework consists of four building blocks; namely, theory, model, typology and paradigm. However, the seven articles analysed are quantitative in nature with no theoretical findings, and in turn no paradigms are discussed. However, several models were developed using various typologies/constructs; in particular, typologies related to organisational performance.

### *Typologies*

As stated earlier, typologies can be defined as conceptual frameworks in which phenomena are classified. These are discussed with reference to the three key search terms.

- *Leadership typologies:* Two types of leadership styles, transformational and transactional, are investigated by two studies (Howell & Avolio, 1993, Golla & Johnson, 2013). The five other studies (García-Morales et al., 2008, García-Morales et al., 2008, Matzler et al., 2008, Overstreet et al., 2013, Noruzy et al., 2013) focus exclusively on the transformational style of leadership,
- *Innovation typologies:* None of the articles analysed investigate innovation in terms of typologies.
- *Performance typologies:* The two most popular typologies of organisational performance (operational and financial) are utilised in the seven articles analysed. Two articles (Howell & Avolio, 1993, Noruzy et al., 2013) use operational performance, four articles (García-Morales et al., 2008, García-Morales et al., 2008, Matzler et al., 2008, Golla and Johnson, 2013) use subjective financial performance, while one uses both operational and subjective financial performance measures (Overstreet et al., 2013). Interestingly enough, none of the articles analysed use objective measures (based on publicly reported annual financial reports) of financial performance.

### *Model and theories*

Five of the seven articles analysed developed a model (García-Morales et al., 2008, García-Morales et al., 2008, Noruzy et al., 2013, Overstreet et al., 2013, Matzler et al., 2008), whereas two studies (Golla & Johnson, 2013, Howell & Avolio, 1993) tested the hypotheses without integrating the results into a model. García-Morales et al. (2008) developed a model using eight constructs, namely, transformational leadership, knowledge slack, absorptive capacity, tacitness, organisational learning, performance, innovation and size. The model investigates the impact of transformational leadership on knowledge slack, absorptive capacity, tacitness, organisational learning and innovation. The model further investigates how tacitness, organisational learning and innovation influence organisational performance. Of significance to this study, the model demonstrates a positive relationship between transformational leadership, innovation and organisational performance.

Subsequently, García-Morales et al. (2008) developed another model using only three constructs; namely, transformational leadership style, organisational innovation and organisational performance. The model investigates how transformational leadership style can influence organisational innovation and organisational performance. Furthermore, the model examines the influence of organisational innovation and organisational performance. The results of the model show that transformational leadership style significantly and positively influences both innovation and organisational performance. In similar vein, the results of the model reveal that organisational innovation also positively influences organisational performance.

Along the same lines, Matzler et al. (2008) investigated the relationship between transformational leadership style, innovativeness, growth and profitability and also developed a model. Although the results reveal that transformational leadership style impacts positively on growth and profitability, the results of the model illustrate that transformational leadership style contributes more significantly to innovativeness. The results also show that innovativeness influences both growth and profitability.

More recently, Noruzy et al. (2013) developed a model using transformational leadership style, organisational learning, knowledge management, organisational innovation and organisational performance. Their study investigates the mediating

effect of organisational learning and knowledge management on the relationship between transformational leadership style and organisational innovation. The authors further investigate how transformational leadership style, organisational innovation and organisational learning impact on organisational performance. In support of prior findings, the model shows that transformational leadership style positively influences organisational innovation and in turn, organisational innovation positively influences organisational performance.

Following a different strategy, Overstreet et al. (2013) developed a covariance-based structural equation model and tested the effect of transformational leadership style on organisational innovativeness and organisational performance (operational and financial). The results support both the direct and indirect effects of organisational innovativeness on the relationship between transformational leadership and organisational performance. It is interesting to note that organisational innovativeness contributes more to operational performance relative to financial performance. It is also worth mentioning that the model illustrates the impact of operational performance on financial performance.

In neither of the other two articles analysed were models developed, but the findings of these studies contribute to the body of knowledge. Contrary to studies in which models were developed, these studies investigate the effects of both transactional and transformational leadership styles on innovation and organisational performance. Furthermore, although Howell and Avolio (1993) did not develop a model, the results of their study validate the model developed by Bass (1985) in several ways. In the first instance, findings show that transformational leadership style directly and positively predicts organisations' unit level performance; and secondly, the results support the fact that innovation moderates the relationship between transformational leadership style and organisational performance. In contrast with previous findings, the results of the study by Golla and Johnson (2013) show a statistically significant relationship between transactional leadership and new product innovation, and a statistically significant relationship between transformational leadership style and revenue related to innovation. Interestingly, the results reveal no relationship between transformational leadership style and new product innovation, and no relationship between transactional leadership style and revenue related to innovation.

## Paradigm

None of the articles explicitly mentions the paradigm adopted for those studies. However, it can reasonably be argued that the only paradigm that fits these studies is the positivist paradigm. According to Bryman (2004), positivism is an epistemological position that advocates the application of the methods of natural sciences to the study of social reality and beyond. The research methodologies for all articles analysed are deductive in nature and the hypothesis testing was conducted in the positivist manner.

The key findings are summarised in Table 2 following the three building blocks of science developed by De Vos et al. (2011).

Table 2: Key findings regarding knowledge of leadership, innovation and performance

Building blocks of science	Findings
Concepts	The most common <b>keywords</b> are transformational leadership and organisational performance. Others include organizational learning, knowledge management, organizational innovation, innovation, dynamic capabilities and organizational innovativeness.
Statements	<p>The following is a synthesis of the <b>definitions</b> found in the articles: <i>Leadership</i>: Transformational leaders focus on long-term vision and inspire and motivate followers to buy into that vision. Transactional leaders focus on individuals' self-interest. <i>Innovation</i>: Introduction of a new idea, product, service or process. <i>Organizational performance</i>: The ability to efficiently and effectively provide a service to the customer while maintaining superior financial returns.</p> <p>Several <b>hypotheses</b> recurred in the articles: Transformational leadership style is positively and significantly associated with innovation. Innovation is positively and significantly associated with superior organizational performance. However, when both transformational and transactional leadership were tested, the results reveal that transactional leadership style is better suited to fostering organizational innovation, whereas transformational leadership style is better suited to improving organizational performance.</p>
Conceptual framework	<p>The following typologies were common in the articles: Leadership: Leadership style is classified into two most popular known styles of leadership, namely, the transformational and transactional leadership styles. The studies investigated do not mention other types of leadership styles. Innovation: None of the studies investigated bother to explore how innovation typologies will impact the nature of the relationship between these three constructs. Performance: The two typologies of organizational performance are operational performance and financial performance. The results reveal that transformational leadership is positively associated with operational performance and in turn leads to superior financial performance. However, only one study explored these typologies. None of the studies explored these typologies using both transformational and transactional leadership styles.</p> <p>There was little distinction between the models presented: The synthesis of all the models developed reveals that leadership style influences organizational innovation and in turn, innovative organisations exhibit superior organizational performance compared to that of competitors.</p>

Building blocks of science	Findings
	Although none of the studies explicitly mentions the paradigm adopted, it can be deduced that researchers adopted a positivist approach of the epistemology paradigm.

## Conclusion

This paper reviewed seven peer-reviewed articles from EBSCOhost and ProQuest. The primary aim was to analyse articles that investigate the relationship between leadership style, innovation and organisational performance using three building blocks of science: concepts, statements and conceptual frameworks, as identified by De Vos et al. (2011).

In assessing the concepts (keywords) used, it can be concluded that the majority of scholars focus exclusively on transformational leadership style when investigating the relationship between three constructs. Interestingly enough, none of the articles uses transactional leadership style as a concept. In the same vein, none of the articles use innovation typologies (incremental and radical), nor financial performance typologies such as return on investment (ROI) or return on assets (ROA). This suggests that very little attention, if any, is paid to the mediating effect of the nature of innovation, namely, incremental and radical, and to the objective measures of financial performance. However, a number of other mediating factors like organisational learning, knowledge management, and dynamic capabilities are considered.

With regard to definitions, the analysis reveals that transformational leadership is the leadership style that is most frequently discussed. The common themes for transformational leadership style that emerge are: (1) influential; (2) inspirational; (3) charismatic; (4) motivational; and (5) intellectually stimulating. In contrast, the common themes for transactional leadership style are: (1) exchange or bargain and (2) individual self-interest. In the same vein, the common themes that emerge for innovation are: (1) new idea, (2) new product, service or process. The central theme of organisational performance, on the other hand, is based on operational effectiveness and efficiency and the financial performance of the organisation.

Where hypotheses and truth statements were studied, the evidence shows that transformational leadership style plays a significant role in cultivating the culture of

innovation in the organisation and, in turn, organisations that practise innovative behaviour generally exhibit superior organisational performance, relative to organisations that display less innovative behaviour. In contrast, more comprehensive analyses (studies that investigate both transformational and transactional leadership styles) of leadership styles reveal that transactional leadership style is better suited if the aim is to instil a culture of innovation, whereas transformational leadership style is mostly associated with the enhancement/improvement of organisational performance.

Typology was the first conceptual framework to be reported on. The assessment reveals a number of gaps in the literature. Firstly, despite the recent study conducted by Golla and Johnson (2013), which illustrates the importance of including transactional leadership style when investigating the relationship between leadership styles, innovation and performance, the majority of studies focus exclusively on transformational leadership style. Secondly, none of the studies investigates the mediating effect of the nature of innovation in the relationship between leadership, innovation and organisational performance. Thirdly, none of the studies uses the objective measures of financial performance based on Generally Accepted Accounting Principles (GAAP) and market-based measures such as price/earnings (P/E) and Tobin's Q.

Theories and models are based on the truth statements and the models previously developed. From studying the reported models, it can be concluded that both transformational and transactional leadership styles have a role to play in cultivating innovative behaviour in the organisation and improving organisations' performance. It is interesting to note that organisational learning plays a pivotal role in the relationship between leadership, innovation and organisational performance.

This article does not only contribute to the understanding of a theoretical link between these variables, but also has practical implications for those in managerial positions. The latter should be aware of the importance of clearly understanding the precise meaning of concepts when discussing relationships between them, and linked to this, the importance of using standardised measures when trying to demonstrate the link between these variables. Managers may also draw from this research that there is indeed a relationship between leadership styles, innovation and organisational performance, and that the appropriate leadership style is required to foster innovation

and facilitate organisational performance. However, this is not a simple relationship. If the main aim is to improve organisational innovation, managers should consider adopting a transactional leadership style. If the main aim is to improve organisational performance, managers should consider adopting a transformational leadership style. If the main aim is to improve organisational performance using innovation as an enabler, managers should consider adopting both a transactional and a transformational leadership style. This is clearly a complex matter and managers are urged to proceed with caution, as available empirical research linking these variables is limited.

### **Limitations and direction for future research**

The first limitation of this study is the sampling procedure. The study did not consider unpublished articles and dissertations. It has been a matter of speculation whether the results of this paper might have been different had dissertations been included as part of the search. Secondly, only EBSCOhost and ProQuest databases were searched. Although these databases are comprehensive, it is not known whether additional articles could have been found on other databases that met the specified search criteria. However, this inherent problem of reviews of the research literature is generally considered to be acceptable. Furthermore, very few articles (only seven) met the set criteria when all three variables were used (i.e. leadership, innovation and performance), indicating a gap in the literature.

The following future research on leadership, innovation and organisational performance is suggested: (1) the mediating effect of the nature of innovation (radical and incremental) on the relationship between leadership and organisational performance; and (2) the use of objective measures (i.e. measures based on Generally Accepted Accounting Principles and market-related measures calculated from annual financial data) of organisational performance, rather than the often subjective measures that are self-reported.



## CHAPTER 3

### OBJECTIVE 2

In this chapter, the second of the eight objectives is presented. The aim of this objective is to consolidate, synthesize and critique the empirical studies that have examined the relationship between organizational climate, innovation and organizational performance. The title of the article, as published in the Journal of Entrepreneurship and Innovation in Emerging Economies, is “*Organizational climate, innovation and performance: A systematic review*”. The format presented in this chapter is in line with the guidelines for authors published by the journal. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **Organizational climate, innovation and performance: A systematic review**

## **Abstract**

Organizational climate plays an important role in the innovation of an organization. In addition, innovation has become critical for nations, organizations and individuals in an increasingly complex and challenging world. Yet very few studies are designed to investigate the causal path of the effect of innovation on organizational performance systematically by examining the influence of organizational climate. The purpose of the study has been to consolidate, synthesize and critique the empirical studies that have examined the relationship between organizational climate, innovation and organizational performance. A systematic literature review approach has been followed to find the appropriate studies on these constructs (organizational climate, innovation and organizational performance) and the building blocks of science (concepts, statement and conceptual framework) have been used as a structure to analyse and report on the findings. After consulting 96 major databases, covering a wide range of fields, only seven articles that investigated the causal path between organizational climate, innovation and organizational performance were identified. The differences and similarities on how concepts were used are presented. These differences become particularly apparent when the tools used to measure these constructs are examined. Studying the articles has also resulted in the development of appropriate and comprehensive typologies concerning the variables. The findings also show that models are typically linear and these are affirmed when subjective, rather than objective, measures are used. This research study alerts researchers and practitioners alike about the importance of clear and shared definitions of constructs. Without that meaningful communication, observation on the topic is impossible. The findings also show that the methods of measurement influence results, which should be considered when interpreting the results.

Keywords: organizational climate, organizational innovation, organizational performance, systematic review

## **Introduction**

The competitive challenges faced by an organization require the organization to search for more innovative and novel approaches to the delivery of their product and services (Shanker, Bhanugopan and Fish, 2012). Innovation is considered by many scholars to be a key driver of organizational performance (Gunday, Ulusoy, Kilic and Alphan, 2011, Grant, 2012, Matzler, Kepler, Deutinger and Harms, 2008). Important to the relationship is an organizational climate for innovation (Nusair, 2013, Panuwatwanich, Stewart and Mohamed, 2008).

Despite the importance of the aforementioned relationship (organizational climate, innovation and organizational performance), the majority of empirical studies that investigate these three constructs are generally fragmented. Some scholars (Lin and Liu, 2012, Zhang and Begley, 2011, Björkdahl and Börjesson, 2011) investigated the relationship between organizational climate and innovation. Others (Durán-Vázquez, Lorenzo-Valdés and Moreno-Quezada, 2012, Oke, Walumbwa and Myers, 2012) investigated the relationship between innovation and organizational performance. Very few studies are designed to trace the causal path between organizational climate, innovation and organizational performance.

A search of 96 academic databases shows that studies that investigate the relationship among organizational climate, innovation and organizational performance in one study are still in their infancy, as reflected in the seven articles published (Nusair, 2013, Choi, Moon and Ko, 2013, Nybakk and Jenssen, 2012, Charbonnier-Voirin, El Akremi and Vandenberghe, 2010, Panuwatwanich et al., 2008, Crespell and Hansen, 2008, Baer and Frese, 2003). The primary objective of this study is to consolidate the published scientific knowledge about the studies that have investigated the impact of the organizational climate for innovation on innovation and organizational performance. In order to do that, the three building blocks of science (concepts, statements and conceptual framework) will be used to analyse the published scientific knowledge.

## **Literature review**

The literature will be presented in two parts. The first part covers the three constructs under investigation, and the second part focusses on what the building blocks of science entail.

### Constructs

#### *Organizational climate*

Several definitions have been proposed for the term organizational climate. According to Hamidianpour, Esmaeilpour, Alizadeh and Dorgoe (2015) organizational climate denotes the employee's perception about the organization's rewards system, leadership credibility, organizational policy, formal and informal procedures, and, ultimately, a sense of belonging and trust within the organization. Perhaps it is with the above definition in mind that Padmaja (2014) argues that organizational climate includes leadership styles, participation in decision-making, the provision of challenging jobs to employees, the provision of a good working environment and the creation of a suitable career ladder for employees. From the employee's point of view, managers are the most important elements in the social exchange climate of an organization (Qadeer and Jaffery, 2014).

#### *Innovation*

Innovation is perceived to be one of the core competences of a successful firm (Chen, Lee, Tsui and Yu, 2012). Yet, despite its importance, the term 'innovation' is still somewhat blurry and is sometimes confused with invention. The term innovation is defined as a new issue that creates value to a firm or stakeholders (Saunila and Ukko, 2012). Innovation can be "incremental" or "radical". Incremental innovation build on existing competencies and is related to minor improvements to existing products or services (Inauen and Schenker-Wicki, 2012). In contrast, radical innovation is the development of new services or a fundamentally new way of organizing and delivering a service (Mustafid and Anggadwita, 2013). As such, the terms 'incremental' and 'radical' indicate the degree of novelty (Un, 2010).

## *Organizational performance*

Organisational performance is the most important indicator of organisational success and one of the most important variables in management research (Stegerean and Gavrea, 2010). According to Lakhal (2014), organisational performance refers to how well an organization achieves its market-oriented objectives as well as its financial goals. Many organizations have developed or adopted a number of organizational performance measurement systems to monitor the success of their corporate strategy. The Balanced-Score Card, however, is touted as the most comprehensive organizational performance measurement system because the tool provides a mix of both financial and non-financial means to monitor and manage organizational performance (Hilman and Siam, 2014). Financial performance includes income generation, annual operating expenditure, cash flow impact, return on assets (ROA), return of equity (ROE), market growth, credit impact and percentage of profit (Gupta, Dutta and Chen, 2014). The non-financial performance includes customer satisfaction, internal process and learning, international ranking, reputation, good governance and customer loyalty (Ariff *et al.*, 2014, Hilman and Siam, 2014).

## Building blocks of science

One of the major traits of science is the focus on phenomena that can be publicly observed and tested (Handfield and Melnyk, 1998). As a result, the three pillars on which science is build are observation, induction, and deduction (Popper, 1961). Perhaps it is in this context that Reynolds (1971) argued that a scientific body of knowledge should consist of concepts and statement. Building on the seminal work of Mouton (1996) and Kerlinger and Lee (2000), De Vos, Strydom, Fouché and Delport (2011) echoed the same sentiments that concepts and statement are central to the building blocks of science, but they went a step further to argue that the conceptual frameworks is an equally important component in the building blocks of science. The three building blocks of science (concepts, statement and conceptual frameworks) guided the authors when analysing the published scientific knowledge.

## *Concepts*

In the Oxford Dictionary, the term 'concept' is defined as "an idea or principle that is connected to an abstract" (Hornby, 2010: 298). In other words, concepts are the

symbolic constructions by means of which people make sense of the meaning attributed to their words (Mouton, 1996). As a result, understanding concepts is the most basic requirement of a scientific enquiry (De Vos *et al.*, 2011). Possibly it is with this context in mind that Sharma and Chrisman (1999) argued that, in order for researchers to be able to build on the existing body of knowledge, it is imperative that the research concept is clearly defined.

### *Statement*

In simple terms, the Oxford Dictionary defines 'statement' as an opinion based on what someone has said or written (Hornby, 2010). A statement takes on many forms which include definition, hypothesis or a proposition (De Vos *et al.*, 2011). For discussion purposes, a brief description of each statement follows:

- A definition is a form of statement that delimits or demarcates the meaning of a word in terms of its sense of reference (Mouton, 1996). A definition can be operational (denotative) or theoretical (connotative). The theoretical definition denotes a specification of the connotative meaning of a concept. The operational definition describes a certain operation, typically some type of a measurement in which the use of the concept is considered to be valid.
- A hypothesis is a statement that should be observed in a real world if the theory is correct (De Vos *et al.*, 2011). The empirical hypothesis is thus an information item that becomes transformed into a new observation, derived from interpreting the hypothesis, using instrumentation, scaling and sampling (Handfield and Melnyk, 1998).
- A proposition is a statement that contains claims that can be tested (Mouton, 1996). Stated differently, a proposition states the relationship between two constructs or more (Bacharach, 1989). Unlike hypotheses, however, propositions involve concepts rather than measures.

### *Conceptual framework*

A framework is defined as the parts of a building or an object that support its weight and give it shape (Hornby, 2010). According to De Vos *et al.* (2011), there are three distinct types of conceptual frameworks, namely, topologies, theories and paradigms:

- A topology is defined as a conceptual framework the phenomena of which can be classified based on common characteristics (Mouton, 1996). In other words, a typology is a systematic classification or a study of types.
- A model is an abstract presentation of reality (De Vos *et al.*, 2011). Along similar lines, Whetten (1989) defined a model as a virtual aid that highlights the main features of the phenomena. Put differently, “a model is a simplified description of the phenomenon in the real world that is an object of the research” (Blunch, 2013).
- A theory is a set of interrelated constructs or variables (Kerlinger and Lee, 2000). According to Dubin (1978), a theory must contain four essential elements, namely “what”, “how”, “why” and “who, where and when”. The first element “what” seeks to identify which factors should be considered as part of the explanation of the phenomenon of interest. Having identified a set of factors (i.e. variables, constructs or concepts), the next logical question is to identify “how” they are related, followed by the rationale behind the relationship. The underlying question about the rationale is “why” the other scholars should give credence to the presentation of the phenomenon. In order to give credence and put forward a particular theory, it is important to state explicitly the limitations and contextual factors that might influence the findings (Morrison, 2003). As such, the questions of “who, where, and when” becomes very important because they address the object, the geographical setting, the organizational type or industry and time horizon in which the phenomenon has been studied.
- A paradigm is a set of beliefs, values and techniques shared by the members of a community (Kuhn, 1970). In other words, a paradigm is a general framework for looking at life (De Vos *et al.*, 2011). The paradigm plays an important role when the researcher embarks on a process of explaining a phenomenon because a research paradigm influences how the researcher views and interprets material and guides the consequent action to be taken about it.

To explore the relationship between climate for innovation, innovation and organizational performance, the three building blocks of science (concepts, statements and conceptual framework) have been examined to analyse prior studies which have investigated the relationship among these constructs critically.

## **Methodology**

This study has adopted two generic steps central to the systematic review methodology, namely, defining the search strategy when engaging the available literature and then selecting relevant studies by applying inclusion and exclusion criteria (Nightingale, 2009). As such, the primary aim of this systematic review is to analyse prior studies which have investigated the relationship among organizational climate, innovation and organizational performance.

The keywords “climate”, “innovation” and “performance” were used in the search. As the keywords “creativity” and “innovation” are occasionally used interchangeably in the literature, these were also included. Similarly, the keywords “financial”, “output”, and “return on investment” (return\*) were used because they are occasionally used interchangeably with performance. The options (criteria) selected for the search were full text, peer-reviewed, scholarly journals and published in English. Target articles needed to match all three keywords in a title, using two major academic databases, namely EBSCOhost and ProQuest. In total 27 articles were retrieved from both EBSCOhost and ProQuest. Seven duplicate articles were, however, identified, resulting in 20 distinct articles retrieved from the search.

The abstracts of the articles which met the first level of inclusion criteria were analysed in order to identify those articles that (1) treat climate for innovation, (2) innovation, performance in a single and (3) performance as variables. Seven articles (presented in Table 1) met these criteria.

## **Findings**

As presented in Table 1, only seven articles were retrieved that investigated the relationship between climate for innovation, innovation and organizational study. These findings illustrate that there is a lack of research that investigates the causal



path among these three constructs. There is, however, no shortage of studies investigating the relationship between these strategic variables when studied in pairs, climate and innovation on one hand and innovation and organizational performance on the other. Studying these constructs in isolation, however, makes it difficult to understand the causal relationship among these constructs.

Of the seven articles that investigated the causal path among organizational climate, innovation and organizational performance, only one is more than ten years old, while the others were published during the last eight years. The seven articles that explicitly investigate the relationship between climate for innovation, innovation and organizational performance were analysed, using the three building blocks of science (concepts, statements and conceptual frameworks) identified by De Vos *et al.* (2011).

### Concepts

As described in the literature review, concepts are the symbolic constructions by means of which people make sense of the meaning attributed to their words (Mouton, 1996). Table 1 presents the list of concepts listed in the article that investigates the relationship among climate for innovation, innovation and organizational performance. These are the words that appear in the keywords list of the article.

Table 1: List of concepts

Year	Author	Title of the article	Concepts
2003	Baer & Frese	Innovation is not enough: climate for initiative and psychological safety, process innovation, and firm performance	None
2008	Crespel & Hansen	Work climate, innovativeness, and firm performance in the US forest sector: in search of a conceptual framework	None
2008	Panuwatwanich, Stewart and Mahomed	The role of climate for innovation in enhancing business performance: The case of design firms	Innovation, construction industry, design and business performance
2010	Charbonnier-Voirin, Akremi & Vandenberghe	A multilevel model of transformational leadership and adaptive performance and the moderating role of climate for innovation	Transformational leadership, adaptive performance, climate for innovation and multilevel analysis
2012	Nybakk & Jenssen	Innovation strategy, working climate, and financial performance in traditional	Innovation strategy, innovative working climate and financial performance

		manufacturing firms: an empirical analysis	
2013	Choi, Moon and Ko	An organization's ethical climate, innovation, and performance: Effects of support for innovation and performance evaluation	Ethical climate, organizational innovation, support for innovation, performance evaluation, financial performance and innovation
2013	Nusair	The role of climate for innovation in job performance: empirical evidence from commercial banks in Jordan	Climate for innovation and job performance

Table 1 reveals that only five of the seven articles listed keywords (Panuwatwanich *et al.*, 2008, Charbonnier-Voirin *et al.*, 2010, Nybakk and Jenssen, 2012, Choi *et al.*, 2013, Nusair, 2013). The most common (more than twice) keywords that appear in the five articles are climate for innovation, innovation and performance. Other keywords are design, transformational leadership, multilevel analysis and ethical climate.

### Statements

The following statements (definitions and hypotheses) were found on the articles analysed. All studies were quantitative in nature, and, as such, there were no propositions.

### *Definitions*

The most common words/phrases defined are organizational climate, climate for innovation, innovativeness, organizational innovation and performance. Other definitions include innovation strategy, culture for innovation and organizational process. For the purpose of this paper, however, the focus is on the three variables under investigation, namely organizational climate, innovation and organizational performance.

- *Organizational climate*: The definitions pertaining to 'climate' include organizational climate, climate for initiative, climate for innovation and support for innovation. According to Crespell and Hansen (2008), organizational climate is an organizational reality composed of behaviours, employee attitudes and feelings, which are characterized by the environment of the organization. Along similar lines, Charbonnier-Voirin *et al.* (2010) adopt the term "organizational climate" as the set of shared perceptions regarding organizational policies and procedures that

convey messages regarding the reward system, which often emerge through social interaction processes. Similarly Baer and Frese (2003) view the term “organizational climate” as being a broad class of organizational variables that describe the organizational context for individual actions. In the same vein, ‘climate for innovation’ is defined as an organizational climate that fosters innovative behaviour (Crespell and Hansen, 2008). In other words, climate for innovation refers to the norms and practices that encourage flexibility, the expression of ideas, and learning (Charbonnier-Voirin *et al.*, 2010). Perhaps it is in this context that Baer and Frese (2003) define ‘climate for initiative’ as the formal and informal organizational practices and procedures that guide and support proactive-ness, self-starting and persistence approach towards the work. In a broader context, Choi *et al.* (2013) define ‘support for innovation’ as the degree to which management encourages employees to try new things and to take risks.

- *Innovation*: None of the study material found in this search defines the word ‘innovation’ explicitly. Instead studies opted to use the word innovativeness and the phrase innovation strategy. Nybakk and Jenssen (2012) adopted the definition of innovativeness of West and Farr (1989). According to West and Farr (1989), the term ‘innovativeness’ is defined as a quality that is shared by most professionals and management workers. Nybakk and Jenssen (2012) go further to argue that, given the appropriate facilitating environment, innovativeness has a potential to be enacted in the working environment. Baer and Frese (2003) adopted a more comprehensive definition of innovativeness put forward by various scholars (Denison, 1996, Hurley and Hult, 1998). Baer and Frese (2003) define innovativeness as a cultural phenomenon that is readily observable in an organizational climate. Even more far-reaching, the innovation strategy is defined as a concept that embodies four dimensions describing the degree to which innovation can be manifested. These dimensions are products, processes, business systems embedded in management values as well as the degree of expenditure in research and development (R&D).
- *Organizational performance*: Only two (Charbonnier-Voirin *et al.*, 2010, Nusair, 2013) of the seven studies which investigate the relationship among organizational climate, innovation and organization performance define organizational performance. Both studies adopted individual performance as a proxy of

organizational performance. In the first study, Charbonnier-Voirin *et al.* (2010) define adaptive performance as the proficiency with which an individual can alter his or her behaviour in order to meet the demand of the environment, an event, or a new situation. This includes skills such as solving problems, dealing with uncertain and unpredictable work situations, handling emergency and crisis situations, learning new work tasks, technologies and procedures, handling work stress, demonstrating interpersonal, culturally- and physically-oriented adaptability. In the second study, Nusair (2013) adopted the performance definition as described by Lawler and Porter (2008) in which they stated that performance is a function of individual ability and skills and effort in a given situation. Although other studies do not explicitly define organizational performance, attempts were made to show how organizational performance is measured. For instance, Baer and Frese (2003) use the firm's goal achievement and return on assets (ROA) as a proxy to measure organizational performance. Panuwatwanich *et al.* (2008) measured organizational performance in terms of economic growth and customer satisfaction. Nybakk and Jenssen (2012) use return on sales (ROS), sales growth rate, return on assets (ROA) and overall competitiveness, whereas Choi *et al.* (2013) opted for sales growth and revenue as a proxy to measure organizational performance.

### *Hypotheses*

Only 17 hypotheses investigated the causal path among organizational climate, innovation and organizational performance. The tested hypotheses provide many truth statements with overwhelming evidence that organizational climate for innovation is positively associated with innovative behaviour. Similarly, innovative behaviour was found to be positively associated with organizational innovation (Baer and Frese, 2003, Crespell and Hansen, 2008, Panuwatwanich *et al.*, 2008, Choi *et al.*, 2013, Nusair, 2013). The results further reveal that organizational innovation is positively associated with organizational performance (Baer and Frese, 2003, Crespell and Hansen, 2008, Panuwatwanich *et al.*, 2008, Charbonnier-Voirin *et al.*, 2010, Nybakk and Jenssen, 2012, Choi *et al.*, 2013, Nusair, 2013).

The study conducted by Nusair (2013) further investigated whether the demographic characteristics (gender, age, education and experience) have an influence on the

relationship between climate for innovation and job performance, and the results showed that there was no relationship. Others studies did not test whether the demographic characteristics mediated the relationship among organizational climate, innovation and organizational performance. Of more significance, Nybakk and Jenssen (2012) confirmed that the innovation strategy is positively and significantly associated with financial performance, measured in sales growth and return on assets.

### Conceptual frameworks

All seven studies analysed are quantitative in nature, and, as such, none of the studies attempted to develop a new theory. Similarly, none of the studies discussed the research paradigm. Four of the seven studies developed and tested the models using various topologies to reach an understanding on the three constructs under investigation.

#### *Topologies*

As described in the literature review, a topology is a conceptual framework in which phenomena are classified. Topologies are discussed below with reference to the three constructs.

- *Organizational climate*: Various topologies have been identified that can be directly linked to organizational climate. These include team climate for innovation (Crespell and Hansen, 2008; Charbonnier-Voirin *et al.*, 2010), leadership for innovation (Panuwatwanich *et al.*, 2008), organizational culture (Panuwatwanich *et al.*, 2008) and support for innovation (Choi *et al.*, 2013).
- *Innovation*: None of the articles analysed presents innovation in terms of topologies.
- *Organizational performance*: The two most popular topologies of organizational performance (financial and non-financial) are utilized. One study (Choi *et al.*, 2013) exclusively used financial measures and two studies (Nusair, 2013, Charbonnier-Voirin *et al.*, 2010) exclusively used non-financial measures. Four studies (Baer and Frese, 2003, Crespell and Hansen, 2008, Panuwatwanich *et al.*, 2008, Nybakk and Jenssen, 2012) opted to use both financial and non-financial measures of organizational performance. Another classification is subjective or objective measures of organizational performance. Objective measures are defined as the

absolute values of a firm's actual performance (Battor and Battor, 2010) whereas subjective measures generally assess the perception of respondents about their company's performance relative to that of their competitors (Greenley, 1995). Five studies used subjective measures, one study using objective measures and the other using both subjective and objective measures of organizational performance.

### *Models*

Four of the seven articles analysed developed and tested a model (Hansen and Crespell, 2008, Panuwatwanich *et al.*, 2008, Charbonnier-Voirin *et al.*, 2010, Choi *et al.*, 2013) whereas the other three studies (Baer and Frese, 2003, Nybakk and Jenssen, 2012, Nusair, 2013) tested the hypotheses without incorporating the results into a model.

Crespell and Hansen (2008) attempted to integrate the concept of work climate, innovativeness and firm performance into a unifying model using structural equation modelling. In order to achieve this objective the authors proposed the operational model consisting of variables such as climate for innovation, managerial attitude toward change, innovation strategy, firm size, organizational innovativeness and firm performance. The scale for management attitude towards change showed a composite reliability below cut-off points and was subsequently deleted in the model. The results revealed that climate for innovation, firm size, and the innovation strategy affect innovativeness, with the innovation strategy having the strongest effect. The study also showed that climate for innovation has both a direct effect and indirect effect (via innovativeness) on firm performance. Furthermore, the results indicated the indirect effect of innovation strategy on firm performance via innovativeness.

Along the same lines, Panuwatwanich *et al.* (2008) proposed a conceptual model which consists of the climate for innovation, innovation diffusion outcome, and firm performance. Within the elements of climate for innovation, the model proposed three key constructs, namely leadership for innovation, team climate for innovation, and organizational culture for innovation. Furthermore, it was proposed that organizational culture for innovation depend on leadership for innovation and team climate for innovation. The model was tested using structural equation modelling, and the results revealed that leadership for innovation has a strong and positive influence on team

climate for innovation and organizational culture. The results further revealed that the team climate for innovation had a moderate and positive influence on the organizational culture for innovation. In turn, the organizational culture for innovation was found to have a strong positive association with the innovation diffusion outcome, whereas business performance appears to be strongly influenced by the outcomes of innovation diffusion.

Charbonnier-Voirin *et al.* (2010) developed a model using four constructs, namely transformational leadership climate, individual perception on transformational leadership, climate for innovation and individual adaptive performance. The primary aim of the study was to test the multi-level model of the relationship between transformational leadership and adaptive performance. Secondly, the study examined the moderating role of climate for innovation on the relationship between transformational leadership and adaptive performance at an individual level. The results revealed that an individual perception of transformational leadership and leadership climate was significantly and positively associated with individual adaptive performance. In addition, the results showed that the relationship between perceptions of transformational leadership and adaptive performance is stronger under a high climate for innovation.

More recently, Choi *et al.* (2013) developed a model to examine how an organization's ethical climate positively relates to its financial performance by considering an organizational innovation, support for innovation and performance evaluation. The model was tested using Partial Least Square (PLS) and, contrary to expectations, the interaction term of performance evaluation and ethical climate was not significant. As a result, performance evaluation was removed from the model. The results revealed that an organization's ethical climate is positively related to financial performance, and its positive relationship is mediated by an organization's innovation. But, of more significance, the results also showed that support for innovation has a moderating effect such that the positive influence of an organization's ethical climate on its innovation increases when support for innovation is high.

Although the other three studies did not develop a model, the findings of these studies contributed to the models discussed above. For instance, the study conducted by Nusair (2013) also confirmed that leadership for innovation, team climate for

innovation and organizational culture for innovation are positively and significantly related to job performance. Similarly, Nybakk and Jenssen (2012) also illustrated that the innovation strategy and innovative working climate have a positive effect on financial performance. Following a slightly different approach, Baer and Frese (2003) showed that climate for initiative is positively and significantly related to company performance. In addition, the study showed that the climate for initiative moderates the relation between process innovations such that a high level of climate for initiative is associated with a positive relation and a low level of climate for initiative is associated with a negative relation.

### *Paradigm*

None of the articles explicitly mentions the paradigm adopted for those studies. One can, however, reasonably maintain that the only paradigm that fits these studies is the positivist paradigm.

### Summary

The key findings regarding knowledge on organizational climate, innovation and performance are presented in Table 2, following the three building blocks of science.

Table 2: Key findings on organizational climate, innovation and performance

Building blocks of science	Findings
Concepts	The most common keywords that appear in the five articles are climate for innovation, innovation and performance
Statements:	<p>The following is a synthesis of the found <b>definitions</b>:</p> <p><b>Organizational climate:</b> organizational climate is an organizational reality composed of behaviours, employee attitudes and feelings, in other words, a set of shared perceptions regarding organizational policies and procedures that convey messages regarding the reward system which often emerge through social interaction processes. Such a climate for innovation carries connotations such as 'norms', 'practices' and 'procedures' that encourages pro-activeness, trying new things and develops employees to take risk.</p> <p><b>Innovation:</b> the term innovation is a quality that is shared amongst professionals, a cultural phenomenon that is readily available underpinning organizational climate, in which innovative ideas manifest themselves.</p> <p><b>Organizational performance:</b> performance can be assessed at individual and organizational level. At individual level, skills such as problem solving, dealing with unpredictable environment, handling crisis situation, work stress and learning new tasks, technologies, cultural and physical oriented adaptability are essential in assessing individual performance. At an organizational level, the firm's financial performance is the most important factor. Non-financial aspects such as customer satisfaction are, however, equally important in assessing organizational performance.</p> <p>Several <b>hypotheses</b> reoccurred in the articles:</p>



Building blocks of science	Findings
	Organizational climate is positively and significantly associated with innovation. Innovation is positively and significantly associated with superior organizational performance. Organizational climate for innovation is influenced by leadership for innovation, team climate for innovation and organizational culture. Of more significance, innovation strategy is found to be strongly and significantly associated to innovativeness.
Conceptual Framework	The following <b>typologies</b> were common: <b>Organizational climate</b> (OC): OC is classified into three categories, namely team climate for innovation, leadership for innovation and organizational culture. <b>Innovation:</b> None of the studies investigated bothers to explore how innovation typologies will have an impact on the nature of the relationship among this three constructs. <b>Performance:</b> The two common topologies of organizational performance are financial and non-financial performance. Other topologies are subjective versus objective measures of organizational performance.
	There was little distinction between <b>models</b> presented: The synthesis of all the models developed reveals that organizational climate influences organizational innovation and, in turn, innovative organizations exhibit superior organizational performance when compared to their competitors. Of more significance is that the innovation strategy is strongly and significantly related to innovativeness whereas organizational size has also been identified as one of the factors that influences the level of innovativeness.
	Although none of the study explicitly mentioned the <b>paradigm</b> adopted, it can be deduced that researchers adopted a positivist of the epistemology paradigm.

## Conclusion

This paper has reviewed seven peer-reviewed articles from EBSCOhost and ProQuest. The primary aim has been to analyse articles that investigated the relationship among organizational climate, innovation and organizational performance using three building blocks of science (concepts, statements and conceptual frameworks) as identified by De Vos *et al.* (2011). For the sake of distinction, the conclusion is discussed with reference to the three building blocks of science.

In assessing the concepts (keywords) used, it can be concluded that the term organizational climate is broad, and it can relate to ethical climate, working environment climate and the specific dimension of organizational climate that relates to innovation. In addition, the analysis of the concepts shows that scholars that focus on climate for innovation recognize the importance of leadership styles and innovation strategy as the mediating factors on the relationship between organizational climates for innovation.

The analysis of definitions reveals that scholars are not consistent when they refer to 'climate for innovation'. Some authors use organizational climate, others use climate for initiative, while yet others use support for innovation. The themes that emerge from organizational climate are 'norms', 'practices' and 'procedures' that encourage proactiveness, trying new things and developing employees to take risks. Similar innovation definitions resemble words such as 'quality', 'cultural phenomenon', 'process', 'processes' and 'business systems'. Central to the definitions of organizational performance is the value of individual performance and the financial performance. The proxy for individual performance includes skills such as dealing with an unfamiliar environment, particularly managing uncertainties. On the other hand, financial performance is assessed in terms of ROA and ROS. Although financial performance is the most preferred benchmark for performance, other scholars have used non-financial measures such as customer satisfaction. Where hypotheses were studied, the literature reveals that organizational climate indeed influences innovation positively, but this is mediated by leadership style and organizational strategy. Of more significance, the analysis showed that innovative organizations generally do relatively better than competitors in terms of financial and non-financial performance.

From studying the reported models, it can be concluded that organizational climate influences the level of innovativeness in the organization. The relationship between organizational climate and innovation is, however, mediated by other factors which include innovation strategy, firm size, leadership style and support for innovation. In turn, the reported models demonstrate that organizational innovation influences organizational performance positively. As such, organizations can create value by promoting a combination of both transformational leadership style and climate for innovation to increase individual and team performance.

From the truth statements, top management is urged to incorporate innovation deeply into corporate strategy by aligning resources, structures and functions around it. In addition, the ability to foster and lead such a work environment requires that top management looks for such a trait during management selection and training. Furthermore, it is important for top management to note and acknowledge that the perception that to remain competitive requires management to pay more attention to innovation can be misleading. The synthesis of the results revealed that an effective

innovation strategy can be achieved only if a strong climate for innovation exists in the organization.

## CHAPTER 4

### OBJECTIVE 3

In this chapter, the third of the eight objectives is presented. The aim of this objective is to report on the methods used in empirical studies that investigate the relationship between leadership style, innovation and organisational performance on one hand and organisational climate, innovation and organisational performance on the other hand. The title of the article, as published at the International Conference on Business and Management Dynamics, is *“The relationship between leadership style, organisational climate, innovation and organizational performance: An investigation into the research methodology used”*. The format presented in this chapter is in line with the guidelines for authors published by the conference organisers. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **The relationship between leadership style, organisational climate, innovation and organisational performance: An investigation into the research methodology used**

## **Abstract**

Orientation: Understanding the impact of leadership style, organisational climate and innovation on organisational performance is important for organisations in order to sustain competitive advantage. However, building an empirical base is hampered by a lack of uniformity in the methods used to study the relationship between these constructs. Research purpose: This paper reports on the methods used in empirical studies that investigate the relationship between leadership style, innovation and organisational performance on one hand and organisational climate, innovation and organisational performance on the other hand. This report provides the necessary structure for future researchers to build on the present body of knowledge using the same or complementary methodologies when creating new knowledge. Research method: A framework based on methodological literature has been designed to analyse journal articles that investigate the relationship between the abovementioned four constructs. Articles to be analysed were identified by using the systematic literature review methodology. Main findings: After consulting 31 research databases, only one article that investigated the relationship between all four constructs was identified. Thirteen articles included three of the four variables. It was found that in many cases authors were not diligent in reporting the methods applied in the research. The findings reveal, however, that the quantitative approach is the most preferred design and the Structural Equation Model (SEM) is the most favoured technique used to analyse data. Managerial implications: This research provides a basis for future researchers to add to the body of knowledge. It is recommended that researchers pay greater attention to reporting the methods used as this will enhance the replication of their work. Contribution: This article provides researchers with a clear picture of how research is conducted in this area, informs them of the shortcomings of present research and identifies the challenges or shortcomings that have been identified by previous researchers.

Keywords: leadership, climate, innovation, performance, methodology

## Introduction

Innovation in organisations is positively and significantly related to superior organisational performance (UI Hassan, Shaukat, Nawaz & Naz, 2013; Yang, Yang & Chen, 2014; Yu-Fang, 2013). Organisational performance can be classified into two categories: namely, financial and non-financial (Shin, Sung, Choi & Kim, 2015). Bearing this in mind, a growing body of literature presents innovation as a key driver of sustainable competitive advantage (Al-Husseini & Elbeltagi, 2012; Chalhoub, 2010; Sarros & Cooper, 2011). Important to this relationship are organisational climate and the role of leadership. The literature shows that the leadership style of senior management has a strong impact on organisational climate with regard to innovativeness and the performance of the organisation (UI Hassan *et al.*, 2013). Similarly, a stream of research has demonstrated that organisational climate plays an important role in the relationship between innovation and organisational performance (Isaksen & Åkkermans, 2011).

Studying these relationships in isolation may lead to an ineffective approach being adopted. For instance, studying leadership and innovation without including organisational climate and performance may result in leaders channelling their energies towards developing a culture of innovation by focusing on only using the appropriate style of leadership. This is a consequence of the lack of understanding of the influence of organisational climate on the relationship between leadership style and organisational performance. Similarly, the exclusion of organisational performance presents a challenge whereby leaders are assured of the type of leadership style that will positively influence innovation. However, they are not sure if the improved level of innovation will ultimately lead to improved organisational performance and because of poor understanding of these strategic variables, organisations may fail to achieve sustainable competitive advantage.

The debate on the nature of the aforementioned relationship is still in its early stages and the methods appropriate to the empirical investigation of this relationship are not clearly defined. In this article, the aim is to report on and critically evaluate the methods used to study the relationship between leadership style, organisational climate, innovation and organisational performance. This is done against the backdrop of standard or traditional methods used in business research. This report will thus inform

future researchers about standard practices in such research as well as highlighting the possible pitfalls.

### **Importance of the research**

The importance of understanding the relationship between leadership style, organisational climate, innovation and organisational performance was introduced above. Although some research has been conducted in this field, the findings were inconclusive, with some studies (Likar, Kopac & Fatur, 2014; Ul Hassan *et al.*, 2013; Yang *et al.*, 2014) showing a positive relationship, while others (Forsman & Temel, 2011; Kannebley, Sekkel & Araújo, 2008; Koellinger, 2008; Martin, Baby & Banga, 2012) showed no relationship. Rubera and Kirca (2012) point out a number of possible reasons for these unconvincing findings, which include, *inter alia*, the methodology used to conduct the study. It is therefore important for the advancement of the field to adopt research strategies based on previous research. This article aims to provide a structure for how research in this area is undertaken for future researchers to draw on and to provide information about the challenges identified by earlier researchers.

### **Literature review**

The literature review defines the four constructs that are the focus of this article and delineates the manner in which reporting on research methods is done. This is followed by a brief description of what the standard research method structure entails.

#### Leadership style

Leadership entails mastering three critical management skills that should be practised consciously, namely, strategic thinking skills, innovative thinking skills and situation management skills (Wilkins & Carolin, 2013). The three fundamental skills may require leaders to adopt different leadership styles, depending on the circumstances. For instance, in transactional leadership theory, compensation is regarded as a motivating factor for employees (Golla & Johnson, 2013; Yukl, 2010) and revolves around an exchange involving the trade of goods or services. In contrast, the influence of transformational leaders does not stem from exchange benefits, but from the logical result of a complex cluster of behaviours and techniques (Swanepoel, Erasmus, Van Wyk & Schenk, 2003). At the heart of transformational leadership theory is the basic

belief that a leader needs to articulate a clearly defined vision to transform the organisation and energise followers to adopt a new paradigm by appealing to issues that are fundamental to their existence (Eustace & Martins, 2014). Research has demonstrated that transactional leadership is suitable when the goal is to instil a culture of innovation (Golla & Johnson, 2013), whereas transformational leadership is more suitable when the goal is to articulate and communicate a coherent vision and strategy to the organisation (Wilkins & Carolin, 2013; Yang *et al.*, 2014).

### Organisational climate

According to Pirola-Merlo, Hartel, Mann and Hirst (2002), organisational climate refers to a set of norms, attitudes and expectations that individuals perceive to operate in a particular social context. As such, organisational climate can be defined as a set of characteristics of an organisation's internal environment that are influenced by its policies and practices (Zhang & Begley, 2011). It is in this context that Chang, Chuang and Bennington (2011) argue that organisational climate conveys a message about the life within the organisation and serves to uphold and perpetuate a particular view of reality shared by members of the organisation. In other words, organisational climate is constituted by recurrent patterns of behaviour, attitudes and feelings that characterise life in the organisation (Björkdahl & Börjesson, 2011).

### Innovation

The term "innovation" is defined within the organisational context as the "management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of the new or improved product, process or equipment" (Trott, 2012:23). Innovation can be incremental or radical. Incremental innovation is based on extending existing technologies and improving features of existing products, services and processes, whereas radical innovation is about creating dramatic change in technology, processes, products or services and ultimately transforming the existing markets and industry or giving rise to new markets (Miller, Miller & Dismukes, 2005). Radical innovations are generally considered to be risky, as they require time, financial resources and expensive knowledge (Cainelli, Evangelista & Savona, 2006). It is in this context that Jenssen and Åsheim (2010) emphasise the importance of



distinguishing between different typologies of innovation because this helps to identify the antecedents of innovation.

### Organisational performance

The concept of organisational performance is central to the understanding of organisational success and the elements responsible for that variation (Hoopes, Hadsen & Walker, 2003). It is important to note that scholars who embark on empirical studies often employ a number of different measures to evaluate financial performance (Berger & Bonaccorsi di Patti, 2006), while others go further and include non-financial performance, such as job satisfaction, productivity and market share (Battor & Battor, 2010; Huang, Lai, Kao & Chen, 2012). To assess financial performance most scholars prefer to use accounting measures such as return on assets (ROA), return on equity (ROE), return on investment (ROI), profitability and sales growth (Cho & Pucik, 2005). Similarly, Tobin's Q is considered by many scholars as the *de facto* standard with regard to market-related measures (Karanja, 2011). The combination of both financial and non-financial measures is viewed by many as the most effective measure of organisational performance. Nonetheless, the exclusive use of either financial or non-financial measures of organisational performance is not implicitly wrong, provided that researchers clearly define which aspects of organisational performance they intend to study (Gentry & Shen, 2010). In this study, organisational performance refers to both financial and non-financial performance.

### **Research method structure**

An analysis of the literature on the structuring of a method section of an academic article reveals repeated inclusion of the following elements, which include sub-sections such as the research paradigm, research design, sampling, measurements, validity and reliability, data collection, data analysis and interpretation, limitations and ethical considerations (APA, 2011; Fabio, Hartung, McIlveen, McMahon & Watson, 2012; Hofstee, 2011; Leedy & Ormrod, 2005; Mouton, 2013; Saunders, 2012). The remainder of the literature review is dedicated to explaining these sub-sections and should guide authors on what should be reported on in a methodology section.

## Research paradigm

A paradigm refers to the entire constellation of beliefs, values and techniques shared by members of a given community (Kuhn, 1970). At an abstract level, there are two major concerns when thinking about research philosophy or paradigm, namely ontology and epistemology. Ontology is concerned with the nature of reality (Saunders, 2012). In other words, researchers take a position regarding their perceptions of how things are and how things work (Scotland, 2012). Conversely, epistemology concerns what constitutes acceptable knowledge in the field of study (Saunders, 2012), in other words, what it means to know (Scotland, 2012). As a result, every paradigm is based on its own ontological and epistemological assumptions.

Positivism is a common stance in business research and many textbooks in the field refer to this paradigm (Mouton, 2013; Olivier, 2004; Saunders, 2012). According to Creswell (2009), positivists attempt to identify causes which influence outcomes. The ontological position of positivism is the one that assumes that objects have an existence independently of the researcher (Cohen, Manion & Morrison, 2007). Furthermore, the positivist epistemology suggests that meaning solely resides in objects, rather than the conscience of the researcher, with the intension of acquiring the meaning (Scotland, 2012). It could be expected that a well-written article makes some kind of declaration on the research paradigm.

## Research design

According to Hofstee (2011) the research design section is where the overall approach to testing the research question or statement is discussed. There, typology of the research design can be classified into two categories, namely, empirical studies and non-empirical studies (Mouton, 2013). Empirical studies derive new knowledge from data, whereas, non-empirical studies use the literature review, modelling and the philosophical and conceptual analysis to develop new knowledge. Empirical studies can be qualitative, quantitative or mixed. Non-empirical studies are generally qualitative in nature. According to Marais (2012) qualitative research approaches the phenomena from the perspective of the subject in order to understand the phenomena in their context. In contrast, quantitative research approaches the phenomena from the perspective of the outsider, with the aim to explain and predict the phenomena

under study in isolation (Marais, 2012). Providing a concise declaration on the design of the research would enable the replication of the conducted research and building on exciting knowledge.

### Sampling

A sample is part of something larger, called a population or universe (Diamantopoulos & Schlegelmilch, 2000). Sampling procedure describes the procedure for selecting the participants or sample from the population (APA, 2011). When selecting a sample from the target population, probabilistic sampling methods (random) are preferred as they guarantee representativeness of the sample (Azevedo *et al.*, 2011). On the other hand, although non-probabilistic sampling methods such as convenient and conservative systematic sampling do not guarantee representativeness of the sample, they are more common and they do not necessarily prevent researchers from validly answering the research question (Azevedo *et al.*, 2011). Having knowledge about the sampling followed in previous research projects could guide prospective researchers to select appropriate sample sizes and inform them of what populations are commonly targeted in a particular field of study.

### Instruments measurements, validity and reliability

The process of measurement can be regarded as the assignment of symbols to characteristics of persons, objects or states of events according to certain rules (Diamantopoulos & Schlegelmilch, 2000). Researchers can therefore either adopt existing instruments or develop their own instruments. To allow replication of the study, the assessment instruments (measurements) should be described in clear detail. In the same vein, the validity and the reliability of the measurements used in the study should also be described in detail (Fabio *et al.*, 2012). Validity refers to how well the research model investigates (1) what it intends to investigate, and (2) to what extent the researcher gains access to the informant's knowledge and meaning. On the other hand, reliability refers to the consistency and stability of the measurement process (Lee, 1999). In other words, reliability is concerned with researchers clearly demonstrating that they have not invented or misrepresented the data collected and the research can be repeated under the same conditions with approximately the same outcomes (Hofstee, 2011). Being in possession of knowledge related to the

instruments used by previous researchers would enable researchers to select the most appropriate instruments for their own use and allow them to build on the base set provided by previous researchers.

### Data analysis and interpretation

Data analysis and interpretation can be viewed as three concurrent flows of activity, namely: data reduction, data display and the conclusion deducted from the data (Miles & Huberman, 1994). According to Hofstee (2011), if the research follows a quantitative design, then the statistical analysis techniques must be described in this section. For instance, when reporting inferential statistics, test values, degrees of freedom, probability values and effect sizes should be reported (Fabio *et al.*, 2012). Most importantly, for inferential statistics, the decision techniques on the interpretation of the results should be determined prior to the data analysis (Diamantopoulos & Schlegelmilch, 2000). In fact, Diamantopoulos and Schlegelmilch (2000) go even further and argue that it is not legitimate to change the level of significance retrospectively (i.e. from .05 to .01), given that the results of the data change or might change based on the significance level.

If the research is qualitative in nature, equally, the researcher should explain how the data are analysed (Hofstee, 2011). In qualitative research, the researcher's own assumptions, bias and subjectivity should be stated upfront (Fabio *et al.*, 2012). Ultimately, the primary aim of the analysis is to understand the various constitutive elements of one's data through the inspection of the relationship between concepts, constructs or variables, whereas the interpretation involves the synthesis of data into larger coherent wholes (Mouton, 2013).

Should prospective researchers examine the work of other researchers in the field, their customs in terms of analytical techniques, as well as the decision rules they apply will become apparent. This will allow for comparison between studies and building a solid base of knowledge on the topic.

### Limitations

The primary purpose of research is to discover the truth (Saunders, 2012). However, all methods have some limitations (Hofstee, 2011). Therefore, it is advisable to

acknowledge the limitations of the research and provide explanations on why the results still validly answer the research question (APA, 2011). In fact, according to Diamantopoulos and Schlegelmilch (2000) it is advantageous to be open and frank about limitations inherent to the research study rather than leaving them to the reader to discover. This kind of knowledge is of particular value to prospective researchers as pitfall and suggestions for improving research are presented here.

### Ethical considerations

Whenever human beings or other creatures with a potential to think, feel and experience physical or psychological distress are the focus of investigation, the ethical implications of what the researcher intends doing must be observed very closely (Leedy & Ormrod, 2005). As such, this section is intended to describe in detail what the researcher has done to ensure that the study adheres to ethical guidelines (Hofstee, 2011). Research ethics, however, goes beyond the protection of human subjects, and include elements such as deception in research, permission to use copyrighted material included in research, permission to use unpublished instruments, as well as honesty with professional colleagues, such as, reporting the findings in a complete and honest fashion, without misrepresenting the data or intentionally misleading others about the nature of the findings (APA, 2011; Leedy & Ormrod, 2005). An analysis of the ethical considerations of those who have published their research can guide aspiring researchers to do their investigations and reports in line with academic standards.

The aforementioned structure should allow researchers to provide essential information on how to make sound and justifiable judgements about the validity of the results and conclusions derived from the study (Azevedo *et al.*, 2011).

### **Method**

This study adopted two generic steps of the systematic literature review methodology, namely (1) a search of the literature and (2) selection of relevant studies by applying inclusion and exclusion criteria. The primary aims of this review were to analyse the methods used in prior studies that investigate the relationship between leadership style, organisational climate, innovation and organisational performance and to

identify emergent themes based on the list of subsections presented in the literature review.

The keywords “leadership” (leaders\*) *or* “climate” (climate\*) were used in conjunction with “innovation” (innov\*; creative\*) *and* “performance” (perform\*; finance\*; outp\*; return\*) in the search for published articles. The options (criteria) selected for the search were full-text, peer-reviewed and scholarly journals. Two major academic databases, namely EBSCOhost and ProQuest, were searched. For articles to be included in the analysis they needed to include all four variables, or leadership with both innovation and organisational performance, or climate with both innovation and organisational performance.

On EBSCOhost, 21 databases (Table 4A1 in the appendix) were searched and 17 articles were retrieved. On ProQuest, ten databases (Table 4A2 in the appendix) were searched and 14 articles were retrieved. In both cases, the search was not limited to a specific time period. In total 31 articles were retrieved from both EBSCOhost and ProQuest. However, seven duplicate articles were identified, resulting in 24 distinct articles retrieved from the search. The abstracts of articles that met the first level of inclusion criteria were analysed in order to identify those studies that treat leadership style and/or organisational climate, as well as innovation and organisational performance as variables.

Validity was addressed by applying an extensive and exhaustive search strategy and applying appropriate selection criteria for the identification of articles. To enhance the reliability of the search, both the author and co-author were involved in decision making regarding the inclusion and exclusion criteria. In total 14 articles, as presented in Table 1 below, met these criteria.

Table 1: Articles that investigate leadership styles, organisational climate, innovation and organisational performance

Article	Year	Author (s)	Title	Journal
1	1993	Howell & Avolio	Transformational leadership, transactional leadership, locus of control and support for innovation: Key predictors of consolidated-business-unit performance	Journal of Applied Psychology
2	2003	Baer & Frese	Innovation is not enough: Climates for initiative and psychological safety, process,	Journal of Organisational Behavior

Article	Year	Author (s)	Title	Journal
			innovations, and firm performance	
3	2008	Crespell & Hansen	Work climate, innovativeness, and firm performance in the US forest sector: In search of a conceptual framework	Canadian Journal of Forest Research
4	2008	García-Morales, Lloréns-Montes & Verdú-Jove	The effects of transformational leadership on organisational performance through knowledge and innovation	British Journal of Management
5	2008	García-Morales, Matías-Reche & Hurtado-Torres	Influence of transformational leadership on organisational innovation and performance depending on the level of organisational learning in the pharmaceutical sector	Journal of Organisational Change Management
6	2008	Matzler, Kepler, Deutinger & Harms	The relationship between transformational leadership, product innovation and performance in SMEs	Journal of Small Business and Entrepreneurship
7	2008	Panuwatwanich, Steward & Mohamed	The role of climate for innovation in enhancing business performance	Engineering Construction and Architectural Management
8	2010	Charbonnier-Voirin, El Akremi & Vandenberghe	A multilevel model for transformational leadership and adaptive performance and the moderating role of climate for innovation	Group and Organisation Management
9	2012	Nybakk & Jenssen	Innovation strategy, working climate, and financial performance in traditional manufacturing firms: An empirical analysis	International Journal of Innovation Management
10	2012	Overstreet, Hanna, Byrd, Cegielski & Hazen	Leadership style and organisational innovativeness drive motor carriers toward sustained performance	The International Journal of Logistics Management
11	2013	Choi, Moon & Ko	An organisation's ethical climate, innovation, and performance effects of support for innovation and performance evaluation	Management Decision
12	2013	Golla & Johnson	The relationship between transformational and transactional leadership styles and innovation commitment and output at commercial software companies	The Business Review, Cambridge
13	2013	Noruzi, Dalfard, Azhdari, Nazari-Shirkouhi & Rezazadeh	Relations between transformational leadership, organisational learning, knowledge management, organisational innovation, and organisational performance: An empirical investigation of manufacturing firms	International Journal of Advanced Technology
14	2013	Nusair	The role of climate for innovation in job performance: Empirical	International Journal of Business and Social Science

Article	Year	Author (s)	Title	Journal
			evidence from commercial banks in Jordan	

The fact that only 14 articles met the inclusion criteria suggests that few studies are designed to trace the effect of innovation on organisational performance by examining the influence of leadership style and/or organisational climate. Interest in this topic seems to be of a contemporary matter, as only two of the 14 articles identified were older than ten years and seven were published less than five years ago.

## Findings

One study (Article 8) included all four variables: leadership style, organisational climate, innovation and organisational performance. The rest of the studies included only three variables. Seven studies (Articles 1, 4, 5, 6, 10, 12 and 13) included leadership style, innovation and organisational performance whereas six studies (Articles 2, 3, 7, 9, 11 and 14) included organisational climate, innovation and organisational performance. For the sake of clarity, a summary of the findings is presented in the Appendix, Table 4A3.

By academic standards, the number of articles that met the inclusion criteria seems to be very small, given that a search with “leadership” and “innovation” delivered 377 articles from EBSCOhost and 161 articles from ProQuest. Furthermore, when the keywords “innovation” and “performance” were used, 843 articles were retrieved from EBSCOhost and 361 articles from ProQuest. When the keywords “climate” and “innovation” were used, 255 articles were retrieved from EBSCOhost and 54 articles from ProQuest. It is thus not that the variables do not exist in the academic domain, but the particular grouping of the variables used for this study is limited.

The articles that met the inclusion criteria were analysed according to the methodology subsections identified in the literature review (see *Research method structure*). The findings are presented below.

### Research paradigm

None of the 14 articles examined explicitly report on the research paradigm adopted for the study. The general theme that emerges from the articles is that leadership style and organisational climate somehow influence innovation in the organisation and in



turn innovativeness leads to superior organisational performance. Therefore, it may be argued that the only paradigm that fits these studies is the epistemology of the positivist paradigm.

### Research design

All 14 articles report on empirical studies. Eleven studies (Articles 2, 3, 6, 7, 8, 9, 10, 11, 12, 13 and 14) adopted a pure quantitative research design approach, whereas the other three studies (articles 1, 4 and 5) adopted a mixed method (qualitative and quantitative) research design approach. For the mixed method studies, researchers used interviews to gather information from key informants to develop constructs for survey questionnaires which were later used to gather quantitative data.

### Sampling

Of the 14 articles analysed, five (Articles 4, 5, 10, 13 and 14) explicitly mention that random sampling was used to select organisations investigated. Four studies (Articles 2, 3, 8 and 11) used purposive sampling and in article 7 convenience sampling were used. In articles 1 and 6 the sampling methods were not clearly specified. Articles 9 and 12 used the entire population. The sample size used in the articles is presented in Table 2 below, divided into three main aspects, namely, the number of companies used in the sample, the target sample and the final sample used.

Table 2: Sample size summary

Article	No. of companies	Target sample	Final sample
1	1	78	78
2	47	269	165
3	1 453	1 453	219
4	N/A	900	408
5	164	164	164
6	97	300	97
7	94	520	94
8	1	464	120
9	36	492	241
10	7	500	158
11	1	36 285	27 577
12	30	104	58
13	106	380	280
14	5	200	200

### Validity and reliability

Twelve (Articles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 13) of the 14 studies tested for validity and reliability of the measures they used, whereas the other two studies (Articles 12 and 14) reused the existing questionnaires that were previously tested for reliability and validity. It was interesting to note that the debate around what an appropriate level of Cronbach's Alpha should be is ongoing, although Cronbach's Alpha of greater than .6 was acceptable. To test reliability, the majority of authors (Articles 1, 2, 3, 4, 5, 6, 7, 8, 11 and 13) preferred to use the minimum cut-off of .7 as acceptable. With regard to validity, authors reported on discriminant validity (Articles 1, 2, 4, 5, 6, 8, 9 and 10), convergent validity (Articles 3, 4, 5, 7, 9 and 10), construct validity (Article 2) and face validity (Article 10). Other authors (Articles 12 and 13) conducted a pilot to test the validity of the instruments used. Article 14 did not report on the validity of the instruments used.

### Measurements

The techniques used to measure leadership style, organisational climate, innovation and organisational performance in the articles that met the inclusion criteria are presented below.

- Leadership style: To measure leadership style the authors of three articles (4, 5 and 13) used a scale developed by Podsakoff, MacKenzie and Bommer (1996). Articles 1 and 12 used a MLQ (Multifactor Leadership Questionnaire) developed by Bass and Avolio (1990). In article 1 the original version of the MLQ was used, whereas in article 12 a later version of the MLQ was used (Avolio & Bass, 2004). In article 6 the scale developed by Wang and Ahmed (2004) was used and in article 8 the scale developed by Podsakoff, Mackenzie, Moorman and Fetter (1990) was used. In article 10 the scale developed by Carless, Wearing and Mann (2000) was used. In other studies (Articles 2, 3, 7, 9, 11 and 14), leadership style was not included as part of the constructs or variables under investigation.
- Organisational climate: Five studies (Articles 2, 3, 9, 11 and 14) adopted existing instruments. Articles 3 and 9 used the scale developed by Amabile *et al.* (1996), article 2 used the scale developed by Frese, Hilburger, Leng and Tag (1997),

article 11 adopted the scale developed by Victor and Cullen (1988) while article 14 opted for the scale developed by Panuwatwanich, Stewart and Mohamed (2008). The authors of Articles 7 and 8 developed their own instrument to measure organisational climate. Other studies (Articles 1, 4, 5, 6, 10, 12 and 13) did not include organisational climate as a construct or as a variable.

- Innovation: Two of the 14 studies (Articles 4 and 13) used the scale developed by Miller and Friesen (1983) to measure innovation. Article 1 used the scale developed by Siegel and Kaemmerer (1978), article 3 used the scale developed by Knowles, Hansen and Shook (2008), article 6 used the scale developed by Wang and Ahmed (2004) and article 9 used the instrument developed by Crespell and Hansen (2008). The studies in articles 10 and 11 used the scale developed by Srinivasan, Lilien and Rangaswamy (2002) and Delery and Doty (1996) respectively. Interestingly, in five studies (Articles 2, 5, 7, 8 and 12) authors opted to develop their own custom measures of innovation.
- Organisational performance: Four of the 14 studies (Articles 6, 10, 13 and 14) used existing scales. In article 13 the scale developed by Cho, Ozment and Sink (2008) was used and in article 6 the scale developed by Churchill and Peters (1984) was used. In article 10 the authors opted to use a measure of operational performance (developed by Zelbst, Green and Sower, 2010) as well as a measure of financial performance (developed by Inman, Sale, Green and Whitten, 2011). In article 14 the tool suggested by Pushpakumari (2008) was used, while other authors (Articles 1, 2, 3, 4, 5, 7, 8, 9, 11 and 12) developed their own measures of organisational performance. Although the majority of authors (Articles 1, 2, 3, 4, 7, 9, 10, 11 and 12) used financial indicators to assess organisational performance, almost all studies used subjective measures (self-reporting) to assess financial performance. In two studies, namely in articles 10 and 11, the researchers opted to use both subjective and objective measures. Two studies (Articles 8 and 14) used non-financial measures as a sole measure whereas three studies (Articles 5, 6 and 13) opted to assess both financial and non-financial measures.

### *Data analysis and interpretation*

The most common analysis technique used is Structural Equation Modelling (SEM). Six of the 14 studies (Articles 3, 6, 7, 9, 10 and 13) analysed used SEM, followed by the Partial Least Squares (PLS) multivariate analysis technique (articles 1 and 11), confirmatory factor analysis (Articles 8 and 12) and recursive non-structured modelling (Articles 4 and 5). Other studies (Articles 2 and 14) used correlation analysis and regression respectively. In SEM, indices such as the Goodness of Fit index (GFI), Adjusted Goodness of Fit (AGFI), normal fit index (NFI), Non-Normal Fit Index (NNFI), Comparative Fit Index (CFI), Root Mean Squared Error of Approximation (RMSEA) and the Standardized Root Mean Squared Residual (SRMR) were reported as being acceptable for the model. With regard to the correlation coefficient, a statistical significance of .05 (Articles 2, 3, 4, 6, 8, 9, 11, 12, 13 and 14), .01 (Articles 1, 2, 3, 5, 7, 8, 9, 11 and 13) or .001 (Articles 4, 7 and 10) was considered to be sufficient.

### Limitations

Several limitations were highlighted in all the articles analysed. The limitation mentioned most frequently was the use of cross-sectional design (Articles 3, 4, 5, 7, 9, 10 and 13), as a cross-sectional analysis does not provide inference on causality. In article 4 specific reference was made about the time lag of innovation, which was not properly factored in. Others also referred to the time interval between innovation and measuring organisational performance (Articles 3, 6, 7, 9, 10 and 12).

The use of self-reporting (Articles 2, 4, 5, 7 and 13), which may be subject to social desirability bias, is seen as a limitation by some. Linked to this is the lack of multiple observations to supplement the survey data (Article 1) and collecting all instruments data from the same source (Articles 4, 5 and 8).

Some also mention that the focus on the measurement is limited. In article 4 the concern is that only a few economic sectors (for example, food, manufacturing, construction and services) were investigated and in article 14 the absence of related studies per se, is deemed to be a limitation. Others were concerned that only certain elements of leadership were evaluated and other factors were excluded (Articles 1 and 6). On a similar note the use of a one-dimensional perspective of organisation

performance, rather than a multi-dimensional perspective (financial, operational and organisational effectiveness) is criticised (Articles 3 and 4).

Lastly, article 5 states that the use of subjective measures of financial performance is a key limitation and suggests that objective measures such as sales growth and earnings per share, among others that are assumed to reflect the fulfilment of the firm's economic goal, should be considered for future research.

### Ethical considerations

Only four (Articles 8, 9, 11 and 14) of the 14 articles analysed explicitly mention how possible ethical issues were addressed. The ethical considerations incorporated by the four articles include requesting permission from the employer to conduct the study in the organisation (Articles 8 and 9), explaining the purpose of the study to participants, allowing them to participate voluntarily (Articles 11 and 14) and assuring participants that the data that they provide will remain anonymous and no names will be reflected on any of the instruments (Articles 11 and 14). Generally, it seems that journal editors are not concerned about ethical requirements (Articles 1, 2, 3, 4, 5, 6, 7, 10, 12 and 13) in investigating these phenomena.

### **Discussion**

The aim of the study was to analyse the methodology used to investigate the relationship between leadership style, organisational climate, innovation and organisational performance using the methodology framework (research paradigm, research design, sampling, measurements, validity and reliability, data collection, data analysis and interpretation, limitations and ethical considerations) identified in the literature review.

In assessing the 14 articles retrieved it was found that the research paradigm is not explicitly reported on. This may reflect indifference or it may be because journal editors in the field are not concerned about explicitly reporting on this. The dominant paradigm used, as deduced through an analysis of the 14 articles, is a positivist paradigm.

In assessing the research design, it can be concluded that most scholars prefer to use the quantitative research design, although others opt to supplement the quantitative

method with the qualitative research design. This was thus done in the exploratory phase of the research. None of the studies used a pure qualitative research design. The design of the research was thus reflective of the paradigm.

Random sampling is the most popular sampling technique used, followed by the purposive sampling technique, which in turn complements the quantitative research design and the nature of the study. However, authors appear to pay little attention to defining the population or stipulating how samples were extracted. The average sample size is approximately 176, excluding outliers. The unit of analysis included mainly organisations, although some studies use business units within one organisation.

In general authors are diligent in reporting on the reliability and validity of the instruments used, except for two articles which are silent on validity. All studies are explicit about the measuring instruments used.

The most common measurement used for leadership style is a scale developed by Podsakoff *et al.* (1996) followed by the MLQ instrument. However, it is worth mentioning that the scale developed by Podsakoff *et al.* (1996) focuses primarily on transformational leadership style, whereas the MLQ is designed to measure various leadership styles, including both transformational and transactional leadership styles. Only two studies that assessed both transformational and transactional leadership styles used the MLQ instrument and five studies focused exclusively on transformational leadership style. In these cases it is thus about the role of transformational leadership rather than about leadership styles.

With regard to the measurement of organisational climate, innovation and organisational performance, no commonly preferred measurement scale exists among scholars. Scholars choose or develop the measuring instruments based on their preferred definitions of these concepts. The absence of a standardized method of assessing climate, innovation and organisational performance makes it difficult to replicate studies or build on existing knowledge. Worth noting is that none of the studies differentiated between radical and incremental innovation and very few studies used both financial and non-financial measures to assess organisational performance.

Most studies focus on financial aspects of organisational performance. Only one study uses an objective measure of financial performance.

Structural equation modelling (SEM) is the most preferred analysis technique among scholars, although other scholars opt for the Partial Least Squares (PLS) multivariate analysis technique, confirmatory factor analysis, recursive non-saturated model, and regression and correlation analysis.

Various limitations are highlighted, but the most common and perhaps the most pressing limitations are the use of a cross-sectional design, which provides for the study of a relationship between constructs, but prevents the inference on causality, followed by time intervals when measuring organisational performance and the use of self-reporting techniques to gather data. The use of subjective measures of organisational performance is also mentioned as serious limitation.

It is interesting to note that few articles explicitly mention the way in which ethical issues were managed. This may be typical of research in the domain of finance, but should also be considered in this type of research where human subjects are requested to provide information on matters such as leadership style, organisational climate and innovation.

## **Conclusion and recommendation**

This research reports on the prevailing methods of conducting research on the relationship between leadership style, organisational climate, innovation and organisational performance. Only study 8 (Charbonnier-Voirin *et al.*, 2010), identified in the search, investigated the relationship between all four constructs. Most of the identified studies investigated the relationship between leadership style, innovation and organisational performance, while others examined the relationship between organisational climate, innovation and organisational performance.

Most of the studies analysed do not, in many respects, meet the standard methodological protocols as set out in the literature. Most evident is the lack of sufficient articulation on research paradigms used, adequate reporting on the nature of the population and sampling methodology, absence of uniform measures of climate, innovation and particularly, organisational performance. Few guidelines exist on

decision-making strategies related to reported statistical results and limited acknowledgement of ethical matters. Notwithstanding, this study is valuable as it clearly sets out the customs in this area.

Researchers are urged to acknowledge the different elements of a comprehensive methodology section and apply this to their research. This will assist readers to judge the value of the research process and contribute to systematically building the body of knowledge in this field. It is important for researchers to note that the method section is the most important part of a research paper because it provides the information that the reader needs to judge the validity of the study. Therefore, providing a clear and precise description of each method sub-section is a crucial aspect of scientific writing. In the same token, researchers are also urged to take cognizance of the impact of limitations of previous studies on future studies.

### **Implication for practice and direction for future research**

Although the findings indicate that none of the studies analysed exhibit severe problems, there are many issues that need to be addressed in future research. First, although cross-sectional studies often produce results that can be generalised to all industries, sometimes the results of those studies can be misleading because such studies average the results across multiple industries and sectors: this can lead to a conclusion that is misleading. Therefore, there is a need for future studies to put more focus on specific industries and sectors.

Second, cross-sectional studies are by nature based on a pre-determined time frame. In this regard, a longitudinal study is suggested to overcome limitations presented by cross-sectional studies.

Third, in order to be more comprehensive, future research should also consider differentiating between radical and incremental innovation and explore the possibility of using both financial and non-financial measures to assess organisational performance. For studies that focus exclusively on financial measures of organisational performance, the use of objective measures is recommended.



## **Limitations**

Although the systematic literature review was conducted in a disciplined manner, this study has limitations. First, the review uses only two databases, albeit the most recognised databases of record: EBSCOhost and ProQuest. These databases may have omitted some relevant studies. Second, the search process was limited to indexed journals available which were peer-reviewed and written in English language. It is not known whether the results of this paper would have been different if non-indexed journals or dissertations and work published in other languages had been included in the search.

## **CHAPTER 5**

### **OBJECTIVE 4**

In this chapter, the fourth of the eight objectives is presented. The aim of this objective is to examine the psychometric instrument used to measure the nature of innovation, that is, incremental and radical innovation. The title of the article, as published at the International Business Conference, is "*An examination of the instrument used to measure incremental and radical innovations: A systematic review*". The format presented in this chapter is in line with the guidelines for authors published by the conference organisers. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **An examination of the instruments used to measure incremental and radical innovations: A systematic review**

## **Abstract**

In this study, the psychometric instrument used to measure the nature of innovation was investigated. The nature of innovation embodies two dimensions: the extent to which existing products, processes or services are utilised to bring about new products (i.e. incremental), and the extent to which the industry is affected by the new product, process or service (i.e. radical). This review focuses on existing instruments used to measure innovation and how they differentiate between incremental and radical innovations. A systematic literature review methodology was followed. In total 15 empirical studies in which innovation is treated as a dependent variable, met the inclusion criteria. The findings reveal that no universally accepted measurement instrument exists for the measurement of radical and incremental innovation. In addition, the findings reveal that the majority of psychometric instruments used to measure innovations exhibited some weaknesses in capturing the elements of radical innovations.

Keywords: creative, innovation, incremental, instruments, radical

## **Introduction**

In an attempt to emphasise the importance of innovation to organisations, innovation scholars live by the mantra “innovate or die” (Getz & Robinson 2003; Gummer 2001; Jagersma 2003; Pury 1994). In support of this notion, streams of empirical studies have demonstrated that innovation is indeed positively and significantly related to superior organisational performance and a competitive advantage (Durán-Vázquez, Lorenzo-Valdés & Moreno-Quezada 2012; Forsman & Temel 2011; Oke, Walumbwa & Myers 2012; Yang, Yang & Chen 2014; Yu-Fang 2013). Yet, despite the importance of innovation, academics and managerial practitioners have not reached a consensus about exactly what innovation, the processes associated with it, and the direct determinants thereof constitute (Karanja 2011).

Perhaps this confusion can be attributed partially to the dual nature of the innovation process, and scholars’ reluctance to pronounce this in their work. The innovation

process is often articulated as being incremental or radical (Garcia & Calantone 2002). However, the terms “incremental” and “radical” are used ubiquitously to refer to the nature of innovation, and this differentiation is not found when examining studies that investigate the relationship between leadership and innovation (Birasnav, Albufalasa & Bader 2013; Golla & Johnson 2013; Tipu, Ryan and Fantazy 2012; Yan & Yan 2013; Yoshida, Sendjaya, Hirst & Cooper 2013) and studies that investigate the relationship between innovation and organisational performance (Forsman & Temel 2011; Oke et al 2012; Yang et al 2014; Yu-Fang 2013).

### **Problem statement and research objectives**

International research (Birasnav et al 2013; Golla & Johnson 2013; Tipu et al 2012; Yan & Yan 2013; Yoshida et al 2013; Forsman & Temel 2011; Oke et al 2012; Yang et al 2014; Yu-Fang 2013) shows that leadership and innovation scholars prefer not to differentiate between incremental and radical innovations. It is argued that what lies behind this phenomenon is the lack of comprehensive instruments to measure innovation (Goswami & Mathew 2005), which result in this dichotomy between the theory and the empirical practice. On the other hand, as Garcia and Calantone (2002) argue, one may question whether it actually matters how innovation is labelled, or measured, suggesting that innovation is innovation, whether incremental or radical.

According to Tellis, Prabhu and Chandy (2009) there is a need for researchers to understand the difference between incremental and radical product innovation. This will result in a clear difference on a strategy which focuses on searching for new products, taking risks, experimentation, flexibility and discovery (Gagne & Deci 2005) and one which focuses on seeking product refinements or adopting continuous improvement models of on-going adaptation (Henderson & Clark 1990). In other words, differentiation should allow organisations and researchers to better understand and manage the antecedents and impact of incremental and radical product innovation (Hoonsopon & Ruenrom 2012).

A clear conceptual distinction between radical and incremental innovations needs to be made before any endeavours can be attempted to identify or develop appropriate instruments to measure these topologies. Although differentiation may be challenging,

there are important conceptual advances offered by considering these topologies (Gilson, Lim, Innocenzo & Moye 2012).

The aim of this research is thus to discuss the concepts of incremental and radical innovations and then examine the instruments used in empirical studies to measure innovations, based on how adequately they encapsulate the definitions of radical and incremental innovation.

## **Literature review**

Innovation has been and continues to be an important topic of study in many disciplines including economics, business, finance and information and communication technology (Sullivan 2008). However, despite the fact that innovation has been studied in a variety of disciplines, understanding of the term “innovation” is still blurry and can sometime be confused with invention, creativity and ideas (Trott 2012). The lack of clarity regarding the exact meaning of innovation is detrimental to the synergy in the current body of knowledge. In fact, Sharma and Chrisman (1999) argue that in order for researchers to be able to build on an existing body of knowledge, it is imperative that the research concept is clearly defined.

This literature review is thus dedicated to explaining the concept of innovation and its nature. Understanding the construct under investigation is the first step in the possible measurement thereof. This is followed by a discussion of other challenges researchers face when dealing with the measurement of innovations.

### The concept of innovation

The term “innovation” is defined, within the organisational context, as the “management of all the activities involved in the process of idea generation, technology development, and manufacturing and marketing of the new or improved product, process or equipment” (Trott 2012:23). Other definitions include the introduction of a novel idea or method and turning them into a widely used practice (Tidd & Bessant 2009) and a new way of doing things, which may change the old job designs and work relationship (Yan & Yan 2013), to mention but a few. The term “innovation” thus generally carries extraneous connotations such as “newness”, “success” and “change” (Assink 2006). Innovation can be incremental, radical, or both,

but will always involve improvement to products or services along the performance dimensions that are valued by existing or mainstream customers (Christensen 1997).

### Radical versus incremental innovations

To begin with, it is important to recognise that although general consensus exists among scholars on what incremental innovation constitutes, the term “radical innovation” is relative and will vary per industry, culture and stages of societal development (Miller, Miller & Dismukes 2005).

Incremental innovation is based on extending existing technologies, and improving features of existing products, services and processes (Miller et al 2005). The primary aim of incremental innovation is to generate growth by offering better performance in existing markets (Christensen 1997). In line with this argument, Trott (2012) points out that incremental innovation generally appeals to existing customers, mainly because they provide improvements to established products. According to Sullivan (2008), incremental innovation, apart from using fewer resources, consists of small endeavours, making them easier to manage. Usually incremental innovations are exploited by established players in an industry, but do not necessarily lead to revolutionary changes in an industry’s landscape. Stated differently, incremental innovations represent improvements to existing products, services and processes through which the organisation often strives to make operations more effective, improve the quality and ultimately decrease costs (Dewar & Dutton 1986).

In contrast, radical innovation is a specific type of innovation that has the potential to substantially alter the basis for competition in the industry (Hüsig, Hipp & Dowling 2005). Radical innovation is about creating dramatic change to technology, processes, products or services and ultimately transforming the existing markets and industry, or give rise to a new market (Miller et al 2005). Perhaps it is in this context that Christensen (2001) argues that radical innovation brings to the market products and services that are not yet valued by customers; therefore, due to its unconventional nature, established firms do not necessarily have resources and capabilities readily available to overcome the challenges presented by radical innovations. Radical innovations are generally considered to be risky, as they need time, financial resources and expensive knowledge (Cainelli, Evangelista & Savona 2006). As a

result, radical innovations generally turn out to be more expensive and risky than incremental innovations.

The themes that emerge from the aforementioned definitions are as follows: Incremental innovations carries terms such as “extension”, “existing”, “improvements” and “small endeavours”. Radical innovations, on the other hand, conveys connotations such as “substantially”, “dramatic change”, “transforming the existing markets”, “give rise to a new market” and “revolutionary changes”.

### Innovation measurements

Measurement is the process of assignment of numerical values to objects or events (Kerlinger & Lee 2000; McBurney & White 2009). As such, the process of measurement can be regarded as the assignment of symbols to characteristics of persons, objects or states of events according to certain rules (Diamantopoulos & Schlegelmilch 2000). It is important to note that the rule by which the numbers are assigned determines the conclusion that will be reached (McBurney & White 2009).

To what exactly numbers are allocated, is problematic. The challenge with measuring innovation is that no single generally accepted definition of innovation exists and this makes identification and measuring difficult (Eggink 2011). Additionally, the use of invention to identify innovation does not necessarily assist because not all invention results in innovation. According to Morris (2008) the nature of innovation presents problems for the measurement process itself, because innovation involves venturing into the unknown, therefore, if we try to pin down these unknowns too quickly, we may make them harder to recognise.

Related to the aforementioned is the lifespan of innovation. The temporal nature of innovation should also be considered when measuring innovation. This creates a number of challenges because different types of innovation will have different lifespans; some innovations will last for a very long time while others may have a short lifespan (Eggink 2011). This is particularly pronounced when considering the different types of innovation. For instance, incremental innovations are continuous in nature and as such there is no beginning and no end to the innovation process. On the other hand, radical innovations, by nature, have a short lifespan.

The most basic requirements of an effective assessment are reliability and validity (Leedy & Ormrod 2005). Reliability is the extent to which the research instrument produces the same results every time it is used, whereas validity tests whether the research instrument measures what it is supposed to measure (Abbott & McKinney 2013). Of particular importance within the context of the research is validity; there are two types of validity, namely, internal and external validity. Internal validity refers to the validity of the research itself, including the measuring instruments used, whereas external validity refers to the extent to which the results of the research can apply to situations beyond the current study (Drost 2011).

The selection of appropriate measures is largely influenced by evidence of internal validity. Internal validity takes different forms (i.e. content, face, criterion and construct), which are applicable to different situations (Leedy & Ormrod 2005). Content validity is the qualitative means of ensuring that the instrument taps on the meaning of the concept as defined by the researcher (Drost 2011). Face validity refers to the extent to which the instrument looks like it measures what it is supposed to measure at face value, whereas criterion validity measures the correlation between two variables (Leedy & Ormrod 2005). On the other hand, construct validity refers to how well the researcher translated or transformed a concept, idea, or behaviour into a functioning and operating reality (Trochim 2006). In other words, construct validity refers to the extent to which the instruments measure the characteristics that cannot be directly observed but are assumed to exist based on the pattern of the concept, idea, or behaviour (Leedy & Ormrod 2005). All the mentioned forms of validity should be considered when evaluating the efficacy of measures of innovation.

## **Methodology**

This study adopted two generic steps central to the systematic review methodology, namely, defining the search strategy when engaging the available literature, and then selecting relevant studies by applying inclusion and exclusion criteria (Nightingale, 2009).

### Literature search strategy

The primary aim of this review was to find and analyse the instruments used to measure incremental and radical innovation in studies that investigated the antecedent



or consequences of innovation. The keywords “radical”, “incremental” and “innovation” were used in the search for appropriate articles on the topic. The criteria for the inclusion of articles in the pool were that they should be full text, peer-reviewed and scholarly journals, and no time limit in terms of date of publication was set. A further requirement for inclusion in the study was that the articles should report on some kind of quantitative measures of innovation. Qualitative studies would thus be excluded. For inclusion in the study, articles needed to meet all of the above criteria.

Two major academic databases, namely, EBSCOhost and ProQuest were used. On EBSCOhost 49 databases (Table 5A1 in the appendix) were searched and 19 articles were retrieved. On ProQuest, 47 databases (Table 5A2 in the appendix) were searched and eight articles were retrieved. In total 27 articles were retrieved from both EBSCOhost and ProQuest. However, seven duplicate articles were identified, resulting in 20 distinct articles retrieved from the search.

The title, keywords and abstracts of each article were independently screened by two authors. Full text articles were retrieved for those studies that appear to meet eligibility criteria. The methodology of the articles which met the first level of inclusion criteria were analysed in order to identify those articles that use measurements, such a five-point scales, to measure incremental and radical innovations. Ultimately, 15 articles (presented in Table 1) met these criteria, and were used in the analysis.

## Findings and discussion

From the selected 15 articles, the instruments used to measure innovation were analysed, focusing particularly on how the instrument(s) differentiated between radical and incremental innovations.

Table 1: Instruments used to measure incremental and radical innovations

Year	Authors	Instrument used to measure incremental and radical innovations
1984	Ettlie, Bridges and O'Keefe	<p><b>Incremental</b> The new product introduction and the adoption of the incremental process were both classified as the incremental process innovation.</p> <p><b>Radical</b> The radical process adoption and the adoption of radical packaging were classified as the radical innovation process.</p>
1986	Dewar and Dutton	<p><b>Incremental</b> (1) Contained new knowledge in the machine or process.</p>

Year	Authors	Instrument used to measure incremental and radical innovations
		(2) Represented an improvement of existing technology. <b>Radical</b> (3) Represented a major technological advance.
2006	Feller, Parhankangas and Smeds	<b>Incremental</b> (1) As an improvement to the existing family. (2) New product family. <b>Radical</b> (3) Is a breakthrough product.
2008	Hurmelinna-Laukkanen, Sainio and Jauhiainen	<b>Incremental</b> If the latest product launch was the modification of the existing product, the company was classified as incremental. <b>Radical</b> In order for the company to be classified as radical, their latest product launch in the main market area had to be reported as completely new.
2009	Forsman	The study was qualitative in nature using case studies project inventions outcome. <b>Incremental</b> The project outcome was considered incremental if it was an idea, practice, service or product which was perceived as new to the enterprise but may have been used previously by other enterprises. <b>Radical</b> The project outcome was considered to be radical if it was an idea, practice, service or product perceived to be new to the market.
2009	Hoonsopon and Ruenrom	<b>Incremental</b> Products that had minor changes in attributes, of which the sets of usefulness or benefits from these changes are minimal in the customer's perspective, were classified as incremental. <b>Radical</b> Products that involve a different set of features and performance attributes, which created a novel set of benefits from existing products in the customer's perspective, were classified as radical.
2011	Arnold, Fang and Palmatier	A three-point item scale was used to measure the degree/extent to which the business unit adopted radical and incremental innovations. <b>Incremental</b> To measure the degree of incremental innovation in the business units, respondents were asked to evaluate the extent to which their business unit's improvement of existing customer service technologies heightened their financial performance. <b>Radical</b> For radical innovations, respondents were asked to evaluate the extent to which the business unit's incorporation of substantially different technologies into their service offerings enhances their financial performance.
2011	Brettel, Heinemann, Engelen and Neubauer	<b>Incremental</b> Incremental innovation represented minor changes on existing processes. <b>Radical</b> Innovations which represented fundamental and revolutionary changes in technology were classified as radical. These innovations incorporated technology that is a clear departure from the state of current knowledge prior to the introduction and have a high degree of new knowledge embodied in the technology.
2011	Gilson and Madjar	An eight-point item scale was used to measure the two forms of innovation. To measure the nature of innovation, respondents

Year	Authors	Instrument used to measure incremental and radical innovations
		<p>were asked to rate the extent to which they agreed or disagreed with some descriptions of their final project.</p> <p><b>Incremental</b> Sample questionnaires included items like “Your project presents refinement on how things are currently done within the company.”</p> <p><b>Radical</b> Radical innovations sample questionnaires included items like “Your project presents discoveries of completely new processes or products than what the company currently does.”</p>
2011	Madjar, Greenberg and Chen	<p><b>Incremental</b> (1) Uses previously existing ideas or work in an appropriate new way, (2) Is very good at adapting already existing ideas or ads, and (3) Easily modifies previously existing work processes to suit current needs.</p> <p><b>Radical</b> (1) Is a good source of highly creative ideas, (2) Demonstrate originality in his/her work, and (3) Suggest radically new ways for doing advertising.</p>
2012	Gilson et al	<p>A seven-point item scale was developed to assess the extent to which individuals characterise the ideas they generate at work as incremental (three items) and radical (four items).</p> <p><b>Incremental</b> Extension builds on what is currently done or what is currently offered. Adaptation to existing processes or products. Incremental improvements upon existing processes or products.</p> <p><b>Radical</b> Radical innovation themes included words like “search”, “discovery” and “fundamental”. Departure from what is currently done or offered. Discoveries of completely new processes or product. Fundamental changes to how things are currently done or what is currently offered. Radical invention beyond existing processes or product.</p>
2012	Hoonsopon and Ruenrom	<p>In the questionnaire, respondents rated their new products ranging from (1) no innovation, to (6) radical innovation, based on how well their products correspond to the following definition of innovate products: “Products that involve a different set of features and performance attributes which makes a novel set of benefits available compared to existing products from a customer perspective.”</p> <p><b>Incremental</b> If the respondents rated their products from 1 to 3, this was considered to be incremental product innovation.</p> <p><b>Radical</b> If the respondents rated their products from 4 to 6, this was considered to be radical product innovation.</p>
2013	Ritala and Hurmelinna-Laukkanen	<p>Two continuous single-item variables were used to measure the level of incremental and radical innovation in coopetition: the respondents were asked to assess (on a scale of 1–7) the innovation benefits that the firm had accrued over the previous five years by collaborating with its competitors. In the questionnaire, respondents rated the benefits from (1) “No such benefits”, to (7) “Very high benefits”.</p> <p><b>Incremental</b></p>

Year	Authors	Instrument used to measure incremental and radical innovations
		For incremental innovation, respondents were asked to rate the benefits towards improving current products or services. <b>Radical</b> For radical innovation, respondents were asked to rate the benefits towards creating completely new products or services.
2014	Xu and Yan	Patent count and citation count to capture firms' investment preferences for incremental versus radical innovations were used to identify innovative characteristics. <b>Incremental</b> A firm with a lower citation count for its granted patents was classified as a firm involved in incremental innovations. <b>Radical</b> Firms with high citation counts for their granted patents were classified as firms involved in radical innovations.

Table 1 shows that of the 15 articles retrieved from the search, only two articles are older than 10 years, nine articles were published in the last five years and the remaining four were published between 5 and 10 years earlier.

#### Reliability and validity of the measurement instruments

In four studies evidence of validity were reported. To measure for construct validity, Forsman (2009) established a chain of evidence using multiple sources and by having key informants reviewing the first draft case studies, whereas the external validity was established by using the replication approach. Other studies (Madjar et al 2011; Hoonsoopon & Ruenrom 2009) used the confirmatory factor analysis (CFA) to test for construct validity. In order to ensure face and content validity, Brettel et al (2011) conducted an interview with an expert to discuss the questionnaire items.

With regard to reliability, Cronbach's alpha was reported and tested in three studies (Arnold et al 2011; Brettel et al 2011; Hoonsoopon & Ruenrom 2009). Several studies used single items to measure innovation, which makes calculating reliability, as per half-split measures such as the Cronbach's alpha, impossible. These authors (Dewar & Dutton 1986; Gilson & Madjar 2011; Gilson et al 2012; Hoonsoopon & Ruenrom 2012; Ritala 2012) use single-item Likert-scale like ratings to measure both radical and incremental innovations. To justify this approach, Ritala (2012) argues that although single-item instruments decrease the possibility of assessing the reliability of the measures, this approach is still viable and sound.

### Radical and incremental innovation measurements

The findings confirm what was found in the literature, namely that no universally accepted instrument to measure radical or incremental innovation exists (Ritala 2012). From the 15 studies identified, none of the studies used the same measurement instrument, although the measurements were very similar to one another.

In line with the definition of incremental innovation presented in the literature (Christensen 1997; Miller et al 2005; Trott 2012), Table 1 shows that incremental innovation measurement items carry connotations such as “improvement”, “existing”, “modification”, “new to the enterprise”, “minor changes”, “refinement” and “adaptation” (Arnold et al 2011; Brettel et al 2011; Dewar & Dutton 1986; Feller et al 2006; Forsman 2009; Gilson et al 2012; Gilson & Madjar 2011; Hoonsopon & Ruenrom 2012; Hoonsopon & Ruenrom 2009; Hurmelinna-Laukkanen et al 2008; Madjar et al 2011; Ritala & Hurmelinna-Laukkanen 2013). Central to the items of incremental innovation are the ideas improvement, modification and refinement of an existing product, process, or service, in order to provide additional value to the customer. In addition, another key indicator for incremental innovation is that this improved product can be new to an organisation, but not necessarily new to the market.

The items used in the measurement instrument to classify radical innovation also resonated with the definition of radical innovation presented in the literature (Christensen 2001; Miller et al 2005). Table 1 demonstrates that radical innovation measurement carries connotations such as “completely new”, “major technology advance”, “breakthrough”, “new to the market”, “novel”, “substantially different”, “fundamental”, “revolutionary” and “discovery” (Arnold et al 2011; Brettel et al 2011; Dewar & Dutton 1986; Feller et al 2006; Forsman 2009; Gilson et al 2012; Gilson & Madjar 2011; Hoonsopon & Ruenrom 2012; Hoonsopon & Ruenrom 2009; Hurmelinna-Laukkanen et al 2008; Madjar et al 2011; Ritala & Hurmelinna-Laukkanen 2013). Central to the items of radical innovation is completely new and revolutionary.

In sharp contrast to other studies, Xu and Yan (2014) use the number of patent counts and citations to classify innovation as either incremental or radical. The authors classify firms with low citations for their granted patent as mainly involved in incremental innovations and in turn classify firms with higher citations for their granted patent to be mainly involved in radical innovation.

The instrument developed by Gilson et al (2012) is the most comprehensive instrument and adequately encapsulates all elements of radical and incremental innovations, as presented in the other measures. The instrument developed by Madjar et al (2011) also, but to a lesser extent, does the same. For incremental innovations, these instruments capture elements such as “extension”, “adaptation” and “incremental improvement” to existing processes, services or products. On the other hand, radical innovations are identified by elements such as “departure”, “discoveries”, “originality”, “radical invention”, and “fundamental changes” to the existing processes, services or products.

Other instruments exhibited some weaknesses in capturing the elements of radical innovations. For instance, Dewar and Dutton (1986) used a “major technology advance” as a sole indicator of radical innovation. Feller et al (2006) assessed radical innovation by asking respondents to classify newly developed products as breakthrough. On the other hand, Hurmelinna-Laukkanen et al (2008) required that latest product launch in the main market area be reported as completely new in order for the company to be classified as radical. Similarly, Forsman (2009) considered the project outcome to be radical if it was an idea, practice, service or product that is perceived to be new to the market. In the same vein, Hoonsopon and Ruenrom (2009) tested for “novelty” in new products and Brettel et al (2011) tested for “fundamental and revolutionary changes”. Ultimately, these instruments with their narrow scope have their shortcomings and can lead to incorrect classification of topologies, which in turn can lead to incorrect inference.

## **Conclusion**

Academics and leadership practitioners acknowledge the importance of product innovation in increasing the quality of life, increasing the firm’s financial position and

ultimately increasing the firm's competitive position in the market (Govindarajan & Kopalle 2006). In order to achieve this, firms must define a pattern of organisational structure and processes that match the type of new products they wish to develop (Jansen, Van Den Bosch & Volberda 2006).

In order to understand these relationships, all variables need to be defined, and this includes a clear and universal understanding of what constitute radical and incremental innovations. The literature reveals that there is indeed a common theoretical understanding from scholars of what constitutes radical and incremental innovations. In contrast, this research shows that no universally accepted measurement instrument exists for radical and incremental innovations. Although most of the instruments capture elements of incremental innovation, the findings shows that the majority of instruments are lacking in terms of capturing all the essentials of these elements, particularly with regard to radical innovations. This can lead to managers making wrong judgments when deciding on the type or the nature of innovation that should be adopted by their originations, given their strategy.

Managers are thus cautioned not to rely on research based on measures that measure only part of the phenomena they are interested in, or measures that emphasise one type of innovation above another. As such, it is recommended that researchers pay more attention to comprehensive measures of the elements, especially of radical innovations, when developing instruments to measure innovations, as that will enhance the validity of the instrument. In this way they can influence decision-making in a responsible manner. From a researcher's perspective it may also be important to be aware of the dangers of using single items to encapsulate a complex phenomenon. Apart from that risk – to content validity – it also limits the possibility of producing reliable data.

### **Limitation and direction for future research**

A limitation of systematic reviews as research tools is that they are constrained by the questions researchers have chosen to investigate and the procedures they used. As a result, although the findings reveal that radical innovations are typically measured as “novelty” and “revolutionary”, this study provided no answers to the (construct)

validity embedded in those words. As such, in order to develop a more comprehensive instrument, future research should pay more attention to the appropriateness of words such as novelty and revolutionary, and only then they can move forward to the development of measurement tools. Those who are interested in radical innovation should perhaps test for concepts such as “departure”, “discoveries”, “originality”, “radical invention” and “fundamental changes” to the existing processes, services or products, and not only the two presented above .

In addition, although the findings reveal a common understanding of what innovation constitutes, future research should attempt to develop a universally accepted instrument to measure innovation. Such an instrument will allow for building on others’ work and eventually establishing a cohesive body of knowledge.



## CHAPTER 6

### OBJECTIVE 5

In this chapter, the fifth of the eight objectives is presented. The aim of this objective is to examine the instruments most frequently used to measure organisational performance when investigating the relationship between innovation and organisational performance. The title of the article, as published in the South African Journal of Entrepreneurship and Small Business Management, is "*Innovation and organisational performance: A critical review of the instruments used to measure organisational performance*". The format presented in this chapter is in line with the guidelines for authors published by the journal. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **Innovation and organisational performance: A critical review of the instruments used to measure organisational performance**

## **Abstract**

This study examines the instruments most frequently used to measure organisational performance when investigating the relationship between innovation and organisational performance. The review focuses on the popularity of both financial and non-financial performance indicators. Using a systematic literature review methodology, 71 empirical studies that investigate the relationship between innovation and organisational performance were identified. In these studies, innovation is treated as an independent variable and organisational performance as a dependent variable. The findings show that profitability, sales growth and return on assets (ROA) are the most preferred accounting-based financial measures of organisation performance. In addition, Tobin's Q was found to be the most favoured market-based financial measure of organisational performance. The study further reveals that market share, customer satisfaction and productivity are the most popular non-financial based measures of organisational performance. This is the first study to investigate whether the indicator used to measure organisational performance can influence the results when investigating the relationship between innovation and organisational performance.

Keywords: innovation, performance, measurements

## **INTRODUCTION**

Organisational performance is an important indicator of organisational success (Stegerean & Gavrea, 2010). Apart from organisational performance, organisational success also relates to employee skills levels, personnel development, quality of strategic planning, and the ability to understand and adapt to the nature and dynamics of the business environment (Carvalho, Ribeiro, Cirani & Cintra, 2016). However, organisational performance is arguably the most important indicator of organisational success and one of the most important variables in management research (Stegerean & Gavrea, 2010).

Research indicates that organisational performance is influenced by innovation (Durán-Vázquez, Lorenzo-Valdés & Moreno-Quezada, 2012; Likar, Kopa & Fatur, 2014; Nybakk & Jenssen, 2012; Oke, Walumbwa & Myers, 2012; Yu-Fang, 2013). Undertaking research on these constructs is important to organisations as managers should be aware of the impact of different variables on organisational performance in order to manage them in an effective manner (Bigliardi, 2013 Ndregjoni & Elmazi, 2012). Yu-Fang (2013), for example, states that the facilitation of innovation is an important management function that can be directly linked to organisational performance.

An important aspect to consider when evaluating innovation efforts and organisational performance is the time factor, given that there is a time lag between innovation initiatives and the outcome that follows (Likar *et al.*, 2014). In fact, O'Connor, Leifer, Paulson and Peters (2008) state that the time lag between innovation and its impact on organisational performance ranges from between three to six years. It is important to note this, as a focus on short-term indicators (for example, return on investment, sales growth and operating income) may be inappropriate and may indicate that innovation strategies are not working, while the effect may only be visible in the longer term (Ndregjoni & Elmazi, 2012).

Although the study of organisational performance has been at the core of management research, very little has been done into the measures that are appropriate to assess the effectiveness of innovation initiatives. In addition, a cursory review of the literature shows that researchers focus on the discussion around typologies of organisational performance on financial and non-financial aspects, with very little attention to other dimensions, such as objective and subjective measures. The present study, therefore, aims primarily to investigate the most frequently used instruments. The results of this investigation will then be used as a lens through which to investigate which typologies (financial vs non-financial; objective vs subjective) of organisational performance were adopted and further to investigate whether the instruments selected played a role in the outcome of the study. This will result in the compilation of a more comprehensive and updated literature review that can form the basis for future research when selecting measures of organisational performance.

## **PROBLEM STATEMENT AND OBJECTIVE**

The results of studies that investigate the relationship between innovation and organisational performance are inconclusive, with some studies (Cortez, Ikram, Nyuyen & Privini, 2015; Mafini, 2015; Carvalho, Riberio, Cirani & Cintra, 2016) showing a positive relationship, while others showed mixed results or no relationship with no definite conclusion (Hervas-Oliver, Sempere-Ripoll & Boronat-Moll, 2014; Simachev, Kuzyk & Feygina, 2015). This inconsistency has been attributed to a number of factors, including, among others, the measures used to evaluate organisational performance.

In an attempt to understand these inconsistencies, Rubera and Kirca (2012), conducted a meta-analysis in a quest to better understand a firm-innovativeness-performance relationship, drawing on the chain-of-effects model as a unifying framework. The study revealed that the size of the firm, the sector in which the firm operates and the nature of innovation (radical innovation, for example) adopted can influence the relationship between innovation and organisational performance. However, although Rubera and Kirca's study is significant in many ways, the study did not investigate whether the type of instruments used to measure organisational performance can also influence the relationship between these constructs. This reveals a gap in the literature and shows the need for a critical review of the influence of the type of instruments used to measure organisational performance on the reported relationship between innovation and organisational performance.

Therefore, the objective of this study is two-fold: firstly, the study seeks to investigate the most frequently used instruments and secondly, the study will investigate whether the type of instruments used does influence the nature of the relationship between these constructs.

## **MEASURES OF ORGANISATIONAL PERFORMANCE**

The construct of organisational performance is central to the understanding of organisational success and the factors responsible for that variation (Hoopes, Hadsen & Walker, 2003). In order to get an accurate and comparative gauge of the variation mentioned, valid and reliable measures are necessary (Saunders, 2012). Although several methods for measuring organisational performance exist, these methods can

be classified into two main categories, namely, financial and non-financial performance measurement (Maltz *et al.*, 2003; Shin, Sung, Choi & Kim, 2015).

### Financial performance measurement

Despite the general consensus among scholars that a firm's performance is a multidimensional construct, one of the most extensively used measures is the financial component – the fulfilment of the economic goal of the organisation (Gentry & Shen, 2010). This is in line with Davidson's (2003) argument that the primary goal (aim) of management is to generate profit and to maximise shareholder value. Important to note is that scholars who embark on empirical studies employ a number of different measures to evaluate financial performance (Berger & Bonaccorsi di Patti, 2003; Davidson, 2003).

The literature research reveals that to assess the financial aspects of organisational performance, researchers generally use either accounting-based measures such as profitability, sales growth, return on assets (ROA), return on sales (ROS), return on equity (ROE), return on investment (ROI), or stock market measures such as Tobin's Q and price earning (P/E) ratio (Hult, Ketchen, Griffith & Chabowski, 2008; Likar *et al.*, 2014; Nawaz, Hassan & Shaukat, 2014; Tsao & Lien, 2013).

In the 1980s researchers primarily used accounting-based measures of financial performance (Hoskisson, Hitt, Wan & Yiu, 1999). However, with the rise of shareholder activism in the late 1980s and early 1990s, organisations started adopting shareholder value maximisation as a measure of financial performance (Useem, 1993). This paradigm shift promoted the adoption of market-based performance measures in management research (Hoskisson *et al.*, 1999).

Despite its limitations, profit maximisation remains one of the key measures of organisational performance (Garg, Joubert & Pellissier, 2004). Various researchers use growth as a sole measure of performance, while others choose to combine growth and profitability (Likar *et al.*, 2014). However, most researchers prefer to combine ROS, ROA, ROE and ROI because they complement one another. The use of a single ratio generally does not provide sufficient information to allow investors to judge the overall performance of the firm (Marx, 2004). For instance, ROA allows analysts to evaluate the effectiveness and efficiency of the firm's management and employees in

generating profit by productively using assets (Firer, Ross & Westerfield, 2008). On the other hand, ROS allows analysts to evaluate the effectiveness and efficiency of the firm's management and employees in generating profit by means of sales (Marx, 2004; Karanja, 2011).

For the sake of clarity, a short explanation of the aforementioned measures is described in Table 1 below.

Table 1: Financial instruments

Instrument	Description
Return on Assets (ROA)	ROA is an accounting measure of a firm's financial performance based on income before tax and interest and it indicates how profitable a firm is in relation to its assets (Alexander & Nobes, 2010). It shows how effective managers are at generating revenue from the invested assets.
Return on Sales (ROS)	ROS is a performance variable used to evaluate the firm's operational efficiency (Karanja, 2011). It indicates how much profit is being generated for each rand of sales.
Return on Investment (ROI)	ROI is defined as net operating income divided by average operating assets (Garrison, Noreen & Brewer, 2008). ROI measures how efficiently the organisation utilises its available assets to generate income. Thus the greater the return on investment, the better (Marx, 2004).
Return on Equity (ROE)	ROE, on the other hand, measures the return earned on the owner's investment. It relates to the return generated for shareholders with finance made available by the shareholders (Alexander & Nobes, 2010). It is calculated by dividing the net profit after tax by the shareholders' equity. Generally, the owners are better off with a higher ROE.

According to Campbell and Mínguez-Vera (2008), accounting-based measures are useful because they provide useful objective measures of organisational performance. However, various authors (Fernandez, 2001; Frigo, 2003; Smith, 2007) argue that accounting measures only reflect the history, both in terms of income statements, which explain what happened in a certain year, and those of the balance sheet, which reflects the state of the firm's assets and liabilities at a certain point in time. As such, it is impossible for accounting-based measures to measure value creation.

The challenge of uncovering the true financial value of innovation is a result of practices such as international financial reporting standards (IFRS) not adequately reflecting innovation expenditure (Frigo, 2003; Smith, 2007). IFRS forces the recording of the immediate expense of investment and thus creates a challenge due to the time lag between innovation expenditure and the effect it has on financial performance. This leads to a situation in which researchers will need to correlate initial expenditure with a product that will only emerge a few years later (Selby, 2010).

Despite the need to measure the effects of innovation, Morris (2008), convincingly argues that measuring innovation presents a problem in itself, because innovation involves venturing into the unknown. Therefore, if one tries to pin down these unknowns too quickly they may become harder to recognise. In addition, when measuring the impact of innovation, the innovation lifespan should also be put into perspective (Eggink, 2011). For instance, sustaining innovation is continuous in nature and as such there is no beginning and no end to the innovation process (OECD/Eurostat, 2005). Moreover, different types of innovation will have different lifespans. For example, some innovations will last for a very long time while others may have a short lifespan.

Several market-related measures are proposed in order to account for the long-term benefits of innovation in an organisation. These include Tobin's Q and price earning (P/E).

- Advocates of Tobin's Q argue that stock market measures incorporate all relevant information and thus, unlike accounting-based measures, they are not limited to a single aspect of financial performance (Lubatkin & Shrieves, 1986). Tobin's Q is a ratio that indicates the market value of the firm in relation to the replacement cost of the tangible assets (Tobin, 1969). Tobin's Q is computed by dividing market capitalisation by the replacement cost of the firm's assets (Cho & Pucik, 2005). Tobin's Q is based on the idea that stock markets, if the takeover market for companies was efficient, would operate at a Tobin's Q of 1 (Karanja, 2011). In other words, the value of 1 for Tobin's Q indicates that the market value of the firm is greater than the value of the recorded assets in the book of accounts. High Tobin's Q value is an indication of higher capital investment. In contrast, a Tobin's Q value of less than 1 indicates that the market value of the firm is less than the recorded assets in the book of accounts.
- Price earning (P/E), on the other hand, is calculated by dividing share price by earnings per share (EPS). In this method, the relationship between the market share price of a share of stock and the stock's current EPS is often stated in terms of P/E ratio (Garrison *et al.*, 2008). The strength of the P/E ratio is its ability to use current and historical data to predict the future. Consequently, investors widely use

the P/E ratio as an indicator of future prospects. A high P/E ratio means that investors are willing to pay a premium for a company stock, mainly because the company is expected to have higher than average future earnings growth. According to Selby (2010), when the company's outlook holds the likelihood of future profit, a generic investor will be more inclined to buy that stock.

Despite the intuitive appeal of the above-mentioned measures of the stock market (Lubatkin & Shrieves, 1986), the assumption of market efficiency has been questioned by prominent scholars in finance (Tobin, 1969). Bettis (1983) argues that, even if the market-efficiency theory holds, stock price does not necessarily reflect its fundamental value because it is influenced by what management chooses to disclose to the investors. Acknowledging that neither accounting nor market-based measures are perfect, management researchers have accepted both accounting and stock market based measures as valid measures of organisational performance (Hoskisson *et al.*, 1999). In support of this view, Shook *et al.* (2004) agree and argue that in order to improve the quality of construct measurement, a stream of management researchers prefer using multiple indicators to measure key constructs and then use the structural equation modelling technique (SEM) to do the analysis. For instance, Tsao and Lien (2013) used both ROA and Tobin's Q whereas Talke, Salomo and Kock (2011) and Padgett and Moura-Leite (2012) decided to use Tobin's Q exclusively, mainly because of its ability to capture the value of long-term investment such as innovation.

#### Non-financial performance measurement

According to Ndrejoni and Elmazi (2012), non-financial measures must also be assessed in order to evaluate overall performance, for two main reasons. Firstly, several interest groups are involved in the business and they all have particular goals and expectations related to the organisation. Secondly, the strategic business areas are not necessarily financial in nature. As a result, several approaches to non-financial indicators exist, such as customer satisfaction and retention, market share, productivity, operational effectiveness and efficiency, reputation, branding and quality



(Battor & Battor, 2010; Ming-Tien & Chung-Lin, 2010; Oke *et al.*, 2012; Ul Hassan *et al.*, 2013).

Alam (2003), after examining the literature on new product performance measures, proposes three performance dimensions for determining the success of new products, namely, financial criteria, customer criteria, and opportunity criteria. As indicated by other scholars, financial criteria include financial indicators of new products such as profitability, sales, cost, return on investment and market share. The second dimension (customer criteria) refers to customer satisfaction and how new products attract new customers and create new market opportunities. The third dimension (opportunity criteria) is much broader in scope as it relates to overall opportunity that can be created by new products. These include, among others, unlocking opportunities for existing products, providing a platform for developing other new products and the skills and experience that can be acquired as a result of new product development projects.

More recently, Gentry and Shen (2010) conducted an extensive literature review on organisational performance with the aim of contributing to the debate concerning appropriate measures of organisational performance. They concluded that the use of both financial and non-financial measures is the most appropriate and sound approach to measure organisational performance. However, the authors further argue that the use of financial aspects of performance as a sole measure is not necessarily wrong, but they emphasise that researchers should always clearly define which aspects of organisational performance they intend to study, and then develop and test the hypotheses around that. All of the above should be viewed against the background research against which organisational performance is measured, namely, objectively and subjectively.

#### Objective vs. subjective measures

Objective measures are the absolute values of a firm's actual performance (Battor & Battor, 2010) and subjective measures generally ask respondents to assess their company's performance relative to that of their competitors (Greenly, 1995). For instance, objective financial measures are audited financial data such as sales, profit, or asset values (Rajah & Reichelstein, 2009). By contrast, the term 'subjective

measure' is used to mean that the company's performance is derived from direct observations by management, financial analysts or employee perceptions about organisational performance (Dawes, 1999). By virtue of its nature, objective measures are verifiable whereas subjective measures cannot be verified (Rajah & Reichelstein, 2009).

## **METHOD**

This study adopted two generic steps central to the systematic review methodology (Nightingale, 2009), namely, defining the search strategy, and then selecting relevant studies by applying the inclusion and exclusion criteria. Originating in medical science, a systematic review differs from conversational reviews in that it aims at synthesizing research in a systematic, transparent and reproducible manner (Tranfield, Denyer & Smart, 2003). A systematic literature review uses explicit, thorough methods to identify, select, appraise and synthesize a set of research studies on a well-defined topic (Robson *et al.*, 2007). The primary aim of this review was to identify and report on the instruments used in prior studies that investigated the relationship between innovation and organisational performance and to identify the most frequently used instruments as well as the rationale behind choosing those instruments.

The keywords "innovation" (innov\*) and "performance" (perform\*) were used in the search. The options (criteria) selected for the search were full text, peer-reviewed and scholarly journals. Target articles needed to match both keywords in a title. Fifty-eight databases on the major database (presented in Table 6A1 in the Appendix), EBSCOhost, were searched for articles and 120 articles were retrieved. Articles in which it is evident from the abstract that either financial or non-financial performance was used as a measure of organisational performance and which were published in English in the last five years and where the full text was available, were included in the study. Only 71 articles (presented in Table 6A2 in the Appendix) met these criteria.

## **FINDINGS AND DISCUSSION**

In the sample of 71 studies, five studies (Articles 10, 17, 19, 40, 46) focused exclusively on non-financial measures, 29 studies (Articles 2, 6, 7, 9, 11, 12, 15, 20, 25, 26, 27, 30, 32, 34, 36, 39, 43, 45, 47, 51, 52, 55, 56, 60, 61, 65, 69, 70, 71) focused exclusively on the financial component and 37 studies (Articles 1, 3, 4, 5, 8, 13, 14,

16, 18, 21, 22, 23, 24, 28, 29, 31, 33, 35, 37, 38, 41, 42, 44, 48, 49, 50, 53, 54, 57, 58, 59, 62, 63, 64, 66, 67, 68) combined both the financial and non-financial instruments to measure organisational performance. The financial (accounting and market) measures are discussed first, followed immediately by the non-financial measures.

### Financial measures

The different instruments used to measure financial performance in the sample of 71 studies are presented in Table 2. From the sample of 71, a total of 16 financial instruments (profit, sales growth, ROA, ROI, turnover, ROE, ROS, Tobin's Q, operating costs, market to book, income, cash flow, basic earning power, long-term debt, inventory turnover and earnings per share) were used to measure financial performance.

Table 2: Financial instruments used to measure organisational performance

No.	Financial instruments	Article reference number	Number of articles
1	Profitability	3, 4, (7), 8, 12, 13, 14, 16, 24, (25), (26), (27), 28, 31, 37, (39), 42, (43), 44, 53, (55), (56), 57, 59, 62, 66, (68), (69), (70)	29
2	Sales/Sales growth	(2), 3, 4, (11), 13, 14, 24, (25), (27), 28, (30), 31, 35, 38, 41, 42, 44, 48, 49, 53, (55), (56), 58, (60), 62, (69), (71)	28
3	Return on assets (ROA)	(6), (9), (11), (15), 18, (20), (26), 31, 48, 49, 52, 58, (65), (69), (70), (71)	16
4	Return on investment (ROI)	3, 4, (6), (27), 33, (34), 38, 41, (56), (70)	10
5	Revenue/ Turnover	5, 18, 23, 41, (45), 47, (61), 63, (69), (71)	10
6	Return on equity (ROE)	(6), (15), 18, (20), (26), (69), (71)	7
7	Return on sales (ROS)	(9), (34), (56), 66, (69), (71)	6
8	Tobin's Q	(34), (36), (51), (65)	4
9	Operating costs	58, 64	2
10	Income	(6), 18	2
11	Cash flow	18, 66	2
12	Market to book	(9)	1

No.	Financial instruments	Article reference number	Number of articles
13	Basic earning power	21	1
14	Risk/long-term debt	(6)	1
15	Inventory turnover	29	1
16	Earnings per share (EPS)	(20)	1
Total			127

*Note: Numbers in brackets represent studies that exclusively used financial measures*

In support of the argument by Cho and Pucik (2005), Table 2 shows that profitability, despite its weaknesses in measuring long-term investment, is the most preferred financial indicator used to measure financial performance, with a staggering 29 studies opting to use this measure, followed by sales growth with 28 studies. The most cited reason for using profitability and sales growth to measure organisational performance is two-fold. Firstly, authors argue that innovative behaviour leads to improved operational performance such as cost efficiency, quality improvement and speed to market, which ultimately results in higher profitability and sales growth (Cambra-Fierro, Hart, Fuster, Mur & Polo-Redondo, 2011; Ul Hassan, Shaukat, Nawaz & Naz, 2013). Secondly, authors (Basterretxea & Martinez, 2012; Cortez & Cudia, 2010; Forsman & Temel, 2011) argue that both profitability and sales growth are the most common indicators used in prior studies to measure organisational performance and, as such, enable a comparison between the output of prior studies and the study in question.

In agreement with literature, ROA completes the top three most commonly used instruments to measure financial performance. Consistent with the rationale for using profitability and sales growth instruments, ROA, ROS, ROI and ROE are generally selected for their popularity in prior studies that investigated innovation and organisational performance (Postruznik & Moretti, 2012; Rubera & Kirca, 2012). Similarly, revenue is preferred because it can be directly linked to innovation activities and it is also a commonly used indicator in prior studies (Eris & Ozmen, 2012; Likar *et al.*, 2014).

Tobin's Q is the most preferred market-based measure of financial performance, with five studies opting to use this measure. In contrast to the reasons provided for using accounting-based measures, Tobin's Q is used mainly because of its ability to capture the value of long-term investment, such as innovation investment (Padgett & Moura-Leite, 2012; Sivakumar, Roy, Zhu & Hanvanich, 2011; Talke, Salomo & Kock, 2011). Furthermore, Table 2 illustrates that financial instruments, such as operating cost, market to book, income, cash flow, basic earning power, inventory turnover and earnings per share (EPS) are not so popular among innovation scholars, despite Selby (2010) presenting a good argument for the use of EPS as a measure of organisational performance, owing to its strength in capturing future expected earnings.

### Non-financial measures

Table 3 presents the instruments used to measure non-financial aspects of organisational performance when investigating the relationship between innovation and organisational performance. From the sample of 71 studies, a total of 10 instruments (market share, customer satisfaction, productivity, operational efficiency, employment growth, quality, competitiveness, reputation or branding, product attractiveness and quick to market) were used to measure non-financial aspects of organisational performance. Table 3 reveals that market share (14 studies), customer satisfaction and retention (12 studies) and productivity (10 studies) are the most popular instruments used to measure non-financial components of organisational performance. Interesting to note is that there are no reasons provided for why the measures were selected. However, one can infer that market dominance, customer satisfaction and productivity were chosen because they are easy to measure and they provide useful information to gauge whether a company is doing well.

Table 3: Non-financial instruments used to measure organisational performance

No.	Non-financial instruments	Article reference number	Number of articles
1	Market share	1, 3, 4, 8, 18, 24, 27, 33, 35, 38, 41, 53, 591, 67	14
2	Customer satisfaction or retention	2, 13, 18, (19), 23, 29, (40), 44, 50, 62, 64, 66	12
3	Productivity	(10), (17), 21, 22, 35, 42, 58, 64, 66, 68	10
4	Operational efficiency	17, 18, (19), 23, 29, 60	6
5	Employment growth	5, 22, 23, 35, 58, 71	6
6	Quality	(17), (19), 23, 64, 66	5

No.	Non-financial instruments	Article reference number	Number of articles
7	Competitiveness	31, 48, 49, 66	4
8	Reputation/Branding	23, (46), 50	3
9	Product attractiveness	(17), 46	2
10	Quick to market	(17)	1
Total			63

*Note: Numbers in brackets represent studies that exclusively used non-financial measures*

Other studies used competitiveness, branding, product attractiveness and quick to market as instruments to measure organisational performance. Studies that focused exclusively on non-financial aspects of organisational performance prefer to use the top three frequently used measures, namely customer satisfaction (Modi, 2012; Oke *et al.*, 2012; Walker *et al.*, 2011), market share (Adner & Kapoor, 2010) and productivity (Ito & Lechevalier, 2010).

#### Subjective vs. objective

Only three studies (Articles 50, 53 and 54) used both objective and subjective measures. In two studies (Articles 50 and 53), the results of the study revealed mixed results and in one study (Article 54), the results showed that innovation leads to superior organisational performance. Despite the importance of using both objective and subjective measures, a considerable number of studies adopted either subjective or objective measures of organisational performance.

#### *Subjective measures*

Table 4 presents the article reference number of studies (see Table 6A2 in the Appendix) that used the subjective measures of organisational performance and the findings of the studies that investigated the relationship between innovation and organisational performance.

Table 4: Subjective measures of organisational performance

Article reference number	Findings	Number of articles
1, 2, 3, 4, 5, 8, 10, 12, 13, 14, 16, 18, 23, 24, 28, 29, 31, 33, 34, 35, 37, 38, 39, 40, 41, 42, 44, 46, 48, 49, 55, 56, 57, 58, 59, 62, 64, 66, 68, 70, 71	Innovation is significantly and positively related to organisational performance	41

Article reference number	Findings	Number of articles
17, 19	The results were mixed (positive, negative or no relationship)	2
Total		43

As stated in the literature, subjective measures are perceived organisational performance where respondents are requested to assess their company's performance relative to that of their competitors. Of the 71 studies that investigated the relationship between innovation and organisational performance, 43 studies used the subjective measures of organisational performance. The findings indicate overwhelming evidence (41 studies) that innovation is positively and significantly related to organisational performance. In contrast, two studies found mixed results.

#### *Objective measures*

Table 5 depicts authors and hypothesis results of studies that used objective measures of organisational performance on the relationship between innovation and organisational performance. Objective measures are the absolute values of a firm's actual performance, which are generally sourced from an independent body such as a stock exchange.

Table 5: Objective measures organisational performance

Article reference number	Findings	Number of articles
7, 9, 26, 27, 30, 36, 47, 52, 60, 61, 63, 65, 71	Innovation is significantly and positively related to organisational performance	13
6, 11, 15, 20, 21, 22, 25, 32, 43, 45, 51, 69	The results were mixed (positive, negative or no relationship)	12
Total		25

Table 5 shows that when objective measures of organisational performance are used, the higher number of studies reveals mixed results. This suggests that the type of instrument used might also influence the results in studies that investigate the relationship between innovation and organisational performance. For example, the study conducted by Liker *et al.* (2014) showed innovation is significantly and positively related to performance when measured using ROE, whereas the same study revealed

no relationship when ROS and ROA were used. Table 5 shows that, of the 25 studies that investigated the relationship between innovation and organisational performance, 13 found a positive relationship and 12 found mixed results.

## **CONCLUSION AND MANAGERIAL IMPLICATION**

The primary purpose of this study is to report on the instruments used to measure organisational performance and investigate whether the type of instrument used to measure organisational performance influences the results of studies which investigated the relationship between innovation and organisational performance. Using the systematic review methodology, this study finds that combining both financial and non-financial measures is touted as the most effective measure of organisational performance. In total, 37 studies use both financial and non-financial measures, which constitute 50.7% of the overall sample of articles. However, a substantial number of authors still prefer to use financial measures as the sole measure of organisational performance, with 29 studies focusing exclusively on the financial measures, which constitute 40.8% of the overall sample. The sole use of financial indicators as a proxy for organisational performance may be informed by the popular notion that ultimately the goal of the organisation is to maximise profit in the short term and to maximise shareholder value in the long term.

In addition, the study provides evidence that profitability, sales growth, ROA, ROS, ROI, ROE, and turnover are the most preferred accounting measures for financial performance. Similarly, the study further reveals that Tobin's Q is the most favoured market-related measure used by innovation scholars to measure financial aspects of organisational performance.

On the other hand, market share, customer satisfaction and productivity measures are reported as the most preferred non-financial measures of organisational performance. This study provides clear evidence that the use of non-financial measures as a sole measure is not a common trend, with only five (7%) of 71 studies opting to exclusively use non-financial measures to measure organisational performance.

The use of any specific measure of organisational performance is not implicitly wrong, but Gentry and Shen (2010) urge that researchers should always be cautious in their



approach and clearly define which aspects of organisational performance they intend to study, and then develop and test hypotheses around that defined area.

When findings were studied, this study shows that organisations that practise innovative behaviour generally exhibit superior organisational performance relative to organisations with less innovative behaviour. The study showed that 54 studies supported the hypotheses that innovation leads to superior organisational performance, which constitute 76% of the overall sample. In addition, the findings also showed that 60.6% of the overall sample used the subjective measures of organisational performance, relative to only 35.2% which used objective measures of organisational performance. When objective measures were used, the findings reveal that a higher number of studies (48%) showed mixed results, no relationship or negative relationship, relative to 0.05% which showed mixed results, no relationship or negative relationship when subjective measures are used. This finding suggests that the selection of the instruments to measure organisational performance does influence the outcome of the results, as shown in studies that investigate the relationship between innovation and organisational performance.

Thus, the implications of the research for both researchers and practitioners can be divided into two main areas:

- Firstly, the study revealed the measurement instrument favoured by researchers. But of significance is that the reasons for selecting the instruments are generally based on the popularity of the instrument in this domain, and not necessarily based on the objective of the study. This observation suggests that researchers should be more cautious when selecting the instrument to measure organisational performance because the instrument has a direct impact on the outcome of the study.
- Secondly, the finding shows that the method in which the instruments is used can affect the outcome of the research. In other words, when subjective measures of organisational performance are used, the outcome of the results is easily predictable. In contrast, when objective measures are used, the extent of variability of the results increases. In other words, the outcome of the results is not easily predictable when objective measures are used. As such, researchers and

practitioners should be more alert to the possible false inferences which may be the result of using a specific method to measure organisational performance, particularly the use of subjective measures.

In conclusion, this finding supports the argument put forward by Gentry and Shen (2010), which states that a thorough literature study should be central to decision-making when selecting measures of organisational performance, as the types of measures seemingly influence the outcome of the enquiry.

## **RECOMMENDATION FOR FUTURE RESEARCH**

This study will hopefully serve as stimulus for future studies to explore all the possible factors that influence findings related to the relationship between innovation and organisational performance. Future studies that investigate the relationship between innovation and organisational performance should try to isolate the role of innovation on organisations, and eliminate the cloud created by factors such as measurement tools, by selecting the instrument(s) based on the objective of the study.

## CHAPTER 7

### OBJECTIVE 6

In this chapter, the sixth of the eight objectives is presented. The aim of this objective is to examine the effect of transformational and transactional leadership styles as well as the effect of each component of transformational and transactional leadership on innovative behaviour. The title of the article, as published by the International Journal of Innovation Management, is “*The impact of leadership styles and the components of leadership styles on innovative behaviour*”. The format presented in this chapter is in line with the guidelines for authors published by the journal. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **The impact of leadership styles and the components of leadership styles on innovative behaviour**

## **Abstract**

The study on which this article is based examined the effect of transformational and transactional leadership styles as well as the effect of each component of transformational and transactional leadership on innovative behaviour. A sample of 3180 respondents from 52 South African companies participated in this research. Two main hypotheses and six sub-hypotheses were tested using multiple regression analysis with and without interaction terms. The results indicate that it is useful to utilise both transformational and transactional leadership styles to enhance employees' innovative behaviour. The study substantiated the expected positive relationship between transformational and transactional leadership style and innovative behaviour. Furthermore, the results showed that amongst the components of these leadership styles, inspirational motivation, intellectual stimulation and contingent reward positively influence innovative behaviour. The results showed no relationship between individual consideration, management-by-exception and innovative behaviour. Contrary to expectations, the results revealed a negative relationship between idealised influence and innovative behaviour. Recommendations and suggestions for further research are provided.

Keywords: leadership style, transformational leadership, transactional leadership, innovative behaviour, innovation

## **Introduction**

Today's global crisis provides fertile ground for innovation and opportunities are at an all-time high (Applegate and Bruce, 2009). Therefore, a growing body of literature has identified innovation as one of the key drivers of companies' performance and sustainable competitive advantage (Al-Husseini and Elbeltagi, 2012; Adegoke *et al.*, 2012). According to Barsh *et al.* (2008), a survey conducted by McKensey in 2007 on 600 global business executives and professionals pointed to leadership as the best predictor of innovation performance. Similarly, a stream of scientific research has demonstrated that leaders play an important role in the promotion of innovativeness

in the organisation (Denti and Hemlin, 2012; Overstreet *et al.*, 2013; Kim and Yoon, 2015).

Avolio *et al.* (1995) described four key components of transformational leadership, namely, idealised influence, inspirational motivation, intellectual stimulation and idealised consideration and two key components of transactional leadership style, namely, contingency reward and management-by-exception. The literature shows that there is consensus amongst scholars that transformational and transactional leadership styles are significantly and positively associated with innovative behaviour (Paulsen *et al.*, 2013; Khan *et al.*, 2012).

Innovation refers to the overall process whereby an invention is transformed into a commercial product and can be sold profitably (Crawford and Di Benedetto, 2006). Literature on innovation reveals some agreement that innovation is a multistage process (Wheelwright and Clark, 1995; Tidd and Bessant, 2013). The two main stages of the innovation process are ideation and implementation (Oke *et al.*, 2009). In the ideation stage, an idea is generated and it is turned into a prototype that can be realised. During the implementation stage, the prototype is transformed into a commercial product that can be sold profitably. The multistage process view indicates that some aspects of innovation are managed at an individual level activities (June and Kheng, 2014).

Oke *et al.* (2009) examined the link between leadership styles and the innovation process and activities and concluded that transformational leadership style is held to be more effective in fostering creativity, whereas transactional leadership style is considered to be more appropriate for the implementation stage. In other words, idealised influence, inspirational motivation, intellectual stimulation and idealised consideration are associated with the ideation stage of the innovation process and contingency reward and management-by-exception are associated with the implementation stage of the innovation process.

Although there is consensus that the right style of leadership to drive the employee's innovative behaviour is necessary, very few studies have been designed to trace the effect of leadership style on innovative behaviour by examining the influence of each component of transformational and transactional leadership style (García-Morales *et*

*al.*, 2008; Jung *et al.*, 2003; Oke *et al.*, 2009). Prior studies that investigated the relationship between the components of leadership style and innovation focused exclusively on transformational leadership style and analysed innovation at an organisational level (Mokhber *et al.*, 2015).

The study on which this article is based was therefore designed to present a better understanding of the relationship between transformational and transactional leadership styles and their components and innovative behaviour in the emerging market context. This elaborates on the influence of the components of both transformational and transactional leadership styles on innovative behaviour at an individual level. Extending research to this level of analysis would contribute to the body of knowledge by providing a more systematic understanding of the relationship between leadership styles and innovative behaviour. In addition, this study is important because most research on the relationship between leadership styles and innovation has been performed in western nations relative to other geographic areas (Alsalam, Behery and Abdullah, 2014; Mozhdeh *et al.*, 2011). This article begins with a brief literature review on prior studies that investigated the relationship between leadership styles and innovative behaviour. Thereafter, the method used and the analysis are outlined, and the results are presented and discussed. The article concludes with an interpretation of the results and implications for business leaders.

## **Literature review and hypothesis development**

For the sake of clarity, this section begins with a brief definition of each leadership style and each type of innovation, followed by a review of prior studies that investigated the relationship between transformational and transactional leadership styles developed by Avolio *et al.* (1995) and innovative behaviour. Four main hypotheses about the relationship between leadership styles and innovative behaviour are proposed.

### Leadership styles

To be effective, responsive, agile and remain resilient during good and bad eras, leaders need to rely on who they are more than what they know or what they do, and above all, leaders need to know what impact they have on those around them (Clayton, 2012). Leaders need to be able to develop talent and evoke the potential in people

and organisations in order to succeed in a volatile, uncertain, complex and ambiguous environment (Dunn, Lafferty and Alford, 2012). Studies on leadership predominantly focus on leadership styles (O'Regan and Ghobadian, 2006). The two leadership styles alluded to most frequently in literature are the transactional and transformational leadership styles (Avolio and Bass, 1995).

### *Transactional leadership style*

Transactional leadership occurs when a leader rewards or disciplines his followers depending on the adequacy of their performance (Yukl, 2010). As such, a transactional leader focuses on an individual's self-interest and motivates an individual through rewards (Golla and Johnson, 2013; Yukl, 2010). In transactional leadership theory, compensation is the motivating factor for employees. As a result, transactional leader strategies to manage individuals are divided into two components: contingency reward and management-by-exception (Avolio *et al.*, 1995).

- *Contingency reward* refers to directing and informing subordinates about the task and rewarding them for completing the task (Bass, 1999). The contingency perspective of leadership suggests that leadership is a social construct and cannot be fully understood when examined in isolation from the context in which it occurs (Yammarino *et al.*, 1998). As such, transactional leaders advocate rewarding followers for achieving a certain level of performance (Waldman *et al.*, 1990). Although rewarding employees for achieving a goal is not necessarily a bad thing, a transactional leader who promises a follower a tangible reward for attaining a particular goal may prompt a follower to adopt the simplest and most straightforward method to solve problems instead of taking up the challenge to explore alternatives (Lee, 2008).
- *Management-by-exception* involves monitoring subordinates and taking action when they are not performing well (Bass, 1999). With management-by-exception, there are active and passive routes. Active management-by-exception means that a leader continually looks at the subordinate's performance and makes changes to the subordinate's work to make corrections throughout the process (Odumeru and Ifeanyi, 2013). In other words, a leader takes notice of any deviation from the rules and regulations and takes corrective action (Chaudhry and Javed, 2012). In the

passive management-by-exception approach, leaders wait for issues to arise before addressing them (Odumeru and Ifeanyi, 2013).

Hickey (2011) warns that although a leader cultivates power in transactional leadership, the power and the relationship do not last beyond the exchange.

### *Transformational leadership style*

Although transformational leadership characteristics are the extension of transactional leadership characteristics, the influence of a transformational leader does not stem from any magical trait, neither does it involve an exchange of benefits but it is the logical result of a complex cluster of behaviours and techniques (Swanepoel *et al.*, 2003). According to Yukl (2010) a transformational leader appeals to the moral values of followers in an attempt to raise their consciousness about ethical issues and mobilise them towards reform. The strategies used by transformational leaders to manage individuals include idealised influence (or charisma), motivational inspiration, intellectual stimulation and individual consideration (Avolio *et al.*, 1995).

- *Idealised influence* refers to the ability of a leader to inspire subordinates' trust, maintain their faith and respect and appeal to their hopes and dreams. In other words, transformational leaders are altruistic role models who engender the respect and admiration of their subordinates. In its simplest form, the degree to which a leader behaves in admirable ways and displays convictions and takes stands that cause followers to identify with the leader.
- *Motivational inspiration* takes place when the leader articulates the vision of the organisation to subordinates in a manner that appeals to them. This means that the leader shapes vision, gains optimistic commitment to that vision and sparks enthusiasm for meeting the challenges of accomplishing the organisational vision.
- *Intellectual stimulation* is the degree to which the leader encourages subordinates to be more creative in finding solutions and creating an environment that fosters innovation. Such leaders present new ideas to followers and challenge them to think critically. Most importantly, they do not criticise mistakes or failures publicly but instead encourage intuition as well as logic in dealing with issues (Bass and Avolio, 1990).



- *Individual consideration* is the degree to which leaders show interest in subordinates' well-being and pay attention to those who are less involved in the group. In other words, the leader gives personal attention to subordinates by treating them differently but equitably (Bass and Avolio, 1990).

In summary, transactional leaders are leaders who exchange tangible rewards for the work and loyalty of followers, whereas transformational leaders are leaders who engage with followers, focus on high order intrinsic needs and raise consciousness about the significance of specific outcomes and new ways in which those outcomes might be achieved (Hay, 2012). Despite the variation between these two styles of leadership, leadership is ultimately rooted in the ability of the leader to think critically, instil such practices in others and engage the entire organisation in critical and aligned thought in the areas of strategy and innovation (Wilkins and Carolin, 2013, p. 257).

### Innovative behaviour

Innovative behaviour is the production or adoption of new and useful ideas, processes, products or procedures within a work role, group or organisation (De Jong and Den Hartog, 2007). Thus innovative behaviour is a multistage process of problem recognition, the generation of ideas and solutions, building support for ideas and idea implementation (Scott and Bruce, 1994; Kellermanns *et al.*, 2008; June and Kheng, 2014). In other words, innovative employees search for and promote new ideas and find support for the implementation of them (Singh and Sarkar, 2012). Put differently, innovative behaviour is a broad set of activities involving the creation and implementation of concepts and products that are new to the organisation (Basu and Green, 1997).

### Leadership style and the innovation process

Innovative behaviour can be viewed as the outcome of various activities, which include amongst others, the role of a leader (Redmond *et al.*, 1993). A leader's role as an influencer of required behaviour may vary from being a transactional leader to being a transformational leader (Oke *et al.*, 2009). According to Munshi *et al.* (2005), leaders

should strive to create an environment in which the appropriate innovative behaviour flourishes.

Innovation scholars often describe the innovation process as being composed of two main stages, namely, ideation and implementation (King and Anderson, 2002; Axtell *et al.*, 2000). Waldman and Bass (1991) examined the link between each component of transformational and transactional leadership style and different stages in the innovation process: idea generation, idea realisation, diffusion and success innovation. The findings also revealed that idealised influence and inspirational motivation, intellectual stimulation and individual consideration are associated with the ideation stage and contingency reward is associated with the implementation stage. The study found no link between the management-by-exception approach and innovation.

More recently Oke *et al.* (2009) analysed the linkage between leadership style and the innovation process and also concluded that the transactional leadership style encourages formal processes and as such ensures implementation, whereas transformational leaders are more likely to enhance creativity or idea generation. In this paper, the focus is on the core innovative behaviour elements that reflect both the ideation and implementation stages.

#### Transformational leadership style and innovative behaviour

In the last five years, the relationship between transformational leadership and innovation has gained attention from scholars. However, most topical studies (Mokhber *et al.*, 2015; Manafi and Subramaniam, 2015; Kim and Yoon, 2015) focus on innovation at organisational level, rather than at individual level (Aryee *et al.*, 2012; Nusair *et al.*, 2012).

From the perspective of the organisational level, Alsalamy *et al.* (2014), using a sample of private and public companies in Dubai, discovered that transformational leadership style is important in addressing intra-organisational innovation. In a more detailed analysis of transformational leadership style components, Mokhber *et al.* (2015), using data from 219 managers from 63 Iranian companies, found that attributive charisma, inspirational motivation and intellectual stimulation correlated positively with organisational innovation. On the other hand, the study found a negative relationship

between idealised influence and innovation and no relationship between individualised consideration and innovation. In another study, Manafi and Subramaniam (2015), using a sample drawn from 23 704 employees from eight companies in Iran, showed that employees' innovative behaviour depends on the leader's ability to drive vision, employees' intellectual stimulation and personal recognition. In contrast, there was no relationship between inspirational communication and innovation.

At an individual level, Nusair *et al.* (2011), using data from 358 employees working in different public sectors in Jordan, found that transformational leadership accounted for 47% of the variation of followers' innovative behaviour. In addition, the results showed that each component of transformational leadership was also positively and significantly correlated with innovative behaviour. Furthermore, the results showed that idealised influence had the highest influential factor and individual consideration had the lowest influential factor with regard to innovative behaviour amongst the four components of transformational leadership. Similarly, Aryee *et al.* (2012), using the self-concept-based theory of leadership and social exchange, demonstrated that transformational leadership style influences innovative behaviour through work engagement. Therefore, the following hypotheses were proposed:

*H1: Transformation leadership has a positive relationship with innovative behaviour.*

Subsequently, the following sub-hypotheses emerged from the abovementioned hypothesis:

*H1a: Idealised influence has a positive relationship with innovative behaviour.*

*H1b: Inspirational motivation has a positive relationship with innovative behaviour.*

*H1c: Intellectual stimulation has a positive relationship with innovative behaviour.*

*H1d: Individual consideration has a positive relationship with innovative behaviour.*

## Transactional leadership style and innovative behaviour

Drawing on the contingency perspective of leadership, Liu *et al.* (2011) examined the relationship between transactional leadership and team innovativeness by focusing on the mediating role of emotional labour. The results showed that transactional leadership was negatively associated with team innovativeness when emotional labour was high, whereas the association was positive when emotional labour was low. Similarly, Golla and Johnson (2013) conducted a study using 30 different companies in the USA and the results showed a strong statistically significant relationship between transactional leadership and new product development. It is interesting to note that the results of the same study showed a strong, statistically significant relationship between transformational leadership style and the percentage of revenue from innovation. Golla and Johnson's study suggested that although transformation leadership is associated positively with innovation, transactional leadership might be better suited when the aim is to foster organisational innovation, whereas transformation is better suited when the aim is to improve organisational performance using innovation as an enabler.

From the individual level perspective, Khan *et al.* (2012) examined the role of transformational and transactional leadership styles and innovative work behaviour amongst bank managers using 100 bank managers from 47 Pakistani banks. In line with prior studies, the results showed that transformational and transactional leadership styles positively predicted innovative behaviour. Therefore, the following hypotheses were proposed:

*H2: Transactional leadership has a positive relationship with innovative behaviour.*

Subsequently, the following sub-hypotheses emerged from the above hypothesis:

*H2a: Contingent reward has a positive relationship with innovative behaviour.*

*H2b: Management-by-exception has a positive relationship with innovative behaviour.*

## Method

In order to investigate the nature of the relationship between leadership styles and innovative behaviour, the study employed a quantitative research design strategy. This section starts by describing the sampling and the method used to collect data, followed by a brief description of the instruments used to measure leadership styles and innovative behaviour constructs. The section concludes with a brief description of how the data was analysed.

### Sample and data collection

In order to test the research hypotheses, the quantitative cross-sectional research design was adopted. Data was collected manually in South Africa, using a survey strategy. Students were recruited to identify organisations and to act as fieldworkers in the study. To be included in the study, participants needed to be employed at a South African organisation with a workforce of at least 60 employees. Once organisations were identified, students were trained to draw a representative sample from a sample frame and shown how to administer the questionnaires appropriately. The sample frame included employees of the organisation, excluding the chief executive officers (CEOs). The CEOs were excluded from the sample frame because generally their role is to report to the board of the organisation, not to a specific individual.

Using this strategy, 3 180 completed questionnaires were obtained, representative of 52 companies from various industries. In total, 55.7% respondents reported that they were male, compared to 43.1% reporting that they were female (missing data = 1.2%). Top management represented 5.1% of the respondents, 70.8% represented a wide range of middle management and professionals (for example, specialists, skilled technical and academically qualified workers, junior management and supervisors) and 23% represented semi-skilled and unskilled workers. As far as race is concerned, 8.3% indicated Asian, 58.4% black, 8.4% coloured, and 24.6% white (missing data = 0.3%). Their ages ranged between 20 and 72, with an average of 37.80 (SD = 9.11). The average working period of a participant in the organisation was 8.39 years (SD = 7.47). Sixty-nine per cent had a diploma/bachelor's degree or higher, 25% had matric

and 4% had less than 12 years' schooling. Respondents were asked to evaluate their immediate supervisors or managers.

### Instruments and measures

The Multifactor Leadership Questionnaire (MLQ-FORM 6S) developed by Avolio, Bass and Jung (1995) was used to measure leadership styles. It is a self-report measure containing 21 items, grouped into seven factors, four representing transformational leadership (idealised influence, inspirational motivation, intellectual stimulation and individual consideration), two being constructs for transactional leadership (contingent reward and management-by-exception) and one construct being for laissez-faire. Extensive research on the instrument indicated an acceptable reliability as well as validity (Antokonis *et al.*, 2003; Bono and Judge, 2004; Muenjohn and Armstrong, 2008). For the current study the alpha value for MLQ was .83 and for the subscales it was 0.94, 0.83 and 0.57 for transformational, transactional and laissez-faire respectively. The laissez-faire leadership construct was excluded in this study because the alpha value is below the cut-off point of 0.7.

Eight item questionnaires on innovative behaviour were developed to assess the extent to which individuals characterise the ideas they generate at work and the Cronbach's Alpha coefficient was 0.85. The 6-point Likert scale was generated after reviewing the work of Kleysen and Street (2001) and De Jong and Den Hartog (2010). Eight items related to the ideation and implementation stages were formulated as questions and participants were asked to rate them on a 6-point Likert scale (1 = Never and 6 = Always). The question for the ideation stage included questions such as "As an employee how often do you put effort into the development of new things?" and "As an employee how often do you systematically introduce innovative ideas into work practices?" for the implementation stage.

### **Analysis and results**

In order to test the hypotheses, correlation and regression analysis was used to examine the nature of the relationship between leadership styles and innovative behaviour. This section begins by presenting the results of the descriptive statistics and correlation matrix, followed immediately by the results of the linear regression analysis.

### Descriptive statistics and correlation

In total, nine constructs are included in this article. These include the innovative behaviour constructs and two leadership style constructs, namely, transformational and transactional leadership with its components as sub-constructs, namely, idealised influence, inspirational motivation, intellectual stimulation, individual consideration, contingent reward and management-by-exception. Table 1 presents the means, standard deviations, Cronbach's Alpha and correlation of all constructs included in the study. The constructs are listed by name in the first horizontal column and by abbreviation in the first vertical row.

Table 1: Means, standard deviations, correlations and Cronbach's Alpha

Measurement	Mean	SD	Correlation with IB	Cronbach's Alpha
Innovative Behaviour (IB)	30.3715	3.70360	-	0.85
Transformational leadership (TFL)	2.5161	0.97203	0.248**	0.94
• <i>Idealised influence (TFL-II)</i>	7.8191	3.15951	0.158**	0.83
• <i>Inspirational motivation (TFL-IM)</i>	7.7399	3.08277	0.250**	0.84
• <i>Intellectual stimulation (TFL-IS)</i>	7.4185	3.14007	0.275**	0.83
• <i>Individual Consideration (TFL-IC)</i>	7.2087	3.27732	0.231**	0.80
Transactional leadership (TSL)	2.5088	0.89996	0.230**	0.83
• <i>Contingent reward (TSL-CR)</i>	6.8327	3.37904	0.243**	0.82
• <i>Management-by-exception (TSL-ME)</i>	8.2203	2.52896	0.167**	0.58

\*\* $p < 0.01$ ; \* $p < 0.05$

The results presented in Table 1 show that both transformational and transactional leadership styles relate positively with innovative behaviour. When individual components were analysed, it was seen that all components of transformational leadership style, (idealised influence, inspirational motivation, intellectual stimulation and individual consideration) are positively related to innovative behaviour. With regard to transactional leadership style, the results also show that both contingent reward and management-by-exception are positively related to innovative behaviour.

### Regression analysis

All hypotheses and sub-hypotheses were tested using multiple regression analysis and the results are presented in Table 2. In general, the hypotheses are supported if the standardised beta coefficient has a positive sign and is significant.

The results of hypotheses H1 and H2 are presented in Model 1 (Table 2). H1 expected transformational leadership style to have a positive effect on innovative behaviour. In support of the hypothesis, the beta coefficient for transformational leadership style and innovative behaviour showed a significant positive impact ( $\beta = 0.178$ ,  $p < 0.01$ ), indicating that there is a strong positive relationship between transformational leadership style and innovative behaviour. Similarly, H2 predicted that a transactional leadership style would have a positive effect on innovative behaviour. This hypothesis is supported ( $\beta = 0.081$ ,  $p < 0.05$ ). Although both transformational and transactional leadership styles have a positive effect on innovative behaviour, the results show that a transformational leadership style has a higher impact on employees' innovative behaviour than a transactional leadership style.

Table 2: Results of linear regression analysis

	Innovative Behaviour (IB)			
	Model 1		Model 2	
	Beta	t	Beta	t
Transformational leadership	0.178**	5.509	-	-
• <i>Idealised influence</i>	-	-	-0.198**	-6.375
• <i>Inspirational motivation</i>	-	-	0.146**	3.723
• <i>Intellectual stimulation</i>	-	-	0.231**	6.545
• <i>Individual consideration</i>	-	-	-0.004	-0.121



	Innovative Behaviour (IB)			
	Model 1		Model 2	
	Beta	t	Beta	t
Transactional leadership	0.081*	2.532	-	-
• <i>Contingent reward</i>	-	-	0.110**	3.384
• <i>Management-by-exception</i>	-	-	-0.019	-0.760
R <sup>2</sup>	0.063		0.092	
Adjusted R <sup>2</sup>	0.062		0.090	

\*\* $p < 0.01$ ; \* $p < 0.05$

In Table 2, the results of sub-hypotheses H1a, H1b, H1c, H1d, H2a and H2b are presented in Model 2. Sub-hypotheses H1a, H1b, H1c and H1d tested the influence of each component of transformational leadership: idealised influence, inspirational motivation, intellectual stimulation and individual consideration on innovative behaviour. Sub-hypotheses H1b and H1c are supported. The results show that intellectual stimulation is the highest influential factor on employees' innovative behaviour ( $\beta = 0.231$ ,  $p < 0.01$ ). It is important to note that when hypothesis H1a was tested, the results showed a negative and significant relationship between idealised influence and innovative behaviour ( $\beta = -0.198$ ,  $p < 0.01$ ), but when H1d was tested, no significant relationship was found between individual consideration and innovative behaviour ( $p > 0.05$ ). When the components of transactional leadership were tested, the results revealed contingent reward as the only factor that influences innovative behaviour ( $\beta = 0.110$ ,  $p < 0.01$ ). No relationship was found between management-by-exception and innovative behaviour ( $p > 0.05$ ).

In summary, the overall results reveal that inspirational motivation, intellectual stimulation and contingent reward have a positive impact on innovative behaviour. In addition, the results showed that intellectual stimulation has the higher impact on innovative behaviour followed by inspirational motivation and contingent reward respectively. The results showed that innovative behaviour is not influenced by either individual consideration or the management-by-exception approach to leadership. Contrary to expectations, the results revealed that idealised influence impacts negatively to employee's innovative behaviour.

## Discussion

This study investigated the impact of transformational and transactional leadership styles on innovative behaviour. An empirical test on 3180 respondents revealed that both transformational and transactional leadership styles have a positive impact on innovative behaviour, which is consistent with the results of the prior study conducted by Khan *et al.* (2012).

Furthermore, the results revealed that of the four components of transformational leadership style, only intellectual stimulation and inspirational motivation were positively and significantly related to innovative behaviour. In addition, the results found a negative relationship between idealised influence and innovative behaviour, and individual consideration was found to have an impact on innovative behaviour. This suggests that a leader who acts as an altruistic role model and engenders the respect and admiration of subordinates can generally be seen as displaying good leadership behaviour, but these aspects are not sufficient if the aim is to improve employees' innovative behaviour.

It is interesting to note that all four of the components of transformational leadership style and innovative behaviour are in line with the results of the prior study conducted by Mokhber *et al.* (2015). The most significant aspect of the results of this study on the nature of the relationship between transformational leadership style and employees' innovative behaviour is that, although both intellectual stimulation and inspirational motivation are positively related to innovative behaviour, intellectual stimulation has the higher impact factor. The literature indicated that components of transformational leadership are associated with the ideation stage (Oke *et al.*, 2009). As such, the results suggest that intellectual stimulation and inspirational motivation are essential when the leader's objective is to improve the creativity of employees and when transforming ideas are generated into tangible products or process. In contrast, the results indicate that idealised influence will impact adversely on an employee's creativity, whereas individual consideration will have no impact.

With regard to transactional leadership style, the results showed that contingent reward was positively related to innovative behaviour, but no relationship was found when management-by-exception was tested. These results suggest that in general,

monitoring subordinates and taking action when they are not performing has no impact on employees' innovative behaviour. These results suggest that if the goal of the organisation is to select the generated ideas and products and transform them into a commercial product that can be sold profitably, then a leader should consider putting more emphasis on rewarding subordinates when the task has been completed.

## **Conclusion**

An investigation was carried out into the nature of the relationship between two leadership styles, namely, the transformational and transactional styles and innovative behaviour. To better understand the nature of the relationship between these constructs, the analysis was conducted at the component level for each leadership style.

From the theoretical perspective, the results of this study highlight the importance of an empirical analysis considering the relationship between leadership styles and their components and innovative behaviour. The researcher used existing questionnaires and the literature to develop measurements for innovation behaviour. When the relationship between transformational leadership and its components and innovative behaviour was examined, the results were very similar to those of the study conducted by Mokhber *et al.* (2015).

The results for both studies showed that inspirational motivation and intellectual stimulation were significantly positively related to innovative behaviour, whereas idealised influence revealed a negative relationship and no relationship was found between individualised consideration and innovation. However, despite the strong similarities between these studies, this study went further, demonstrating that intellectual stimulation is the most essential component of transformational leadership, in particular if the aim is to enhance innovative behaviour.

The results for the transactional leadership style supported the studies that were conducted by Khan *et al.* (2012) and Golla and Johnson (2013). However, the results of this study provided new insight when components of transactional leadership style were analysed: contingent reward had an influence on innovative behaviour, which was not surprising. It was also found that management-by-exception had no influence on innovative behaviour.

The conclusion that can be drawn from the above synthesis is twofold: firstly, the results suggest that if the aim is to improve innovative behaviour within the organisation, then the leader should adopt both transformational and transactional leadership styles. However, most of the energy should be channelled towards creating an environment that fosters innovation, articulating the vision to subordinates in the manner that appeals to them and, where necessary, rewarding employees for presenting innovative ideas that can be translated into commercial output.

The contribution of this study is the establishment of the link between components of transformational and transactional leadership style and innovative behaviour. Most importantly, the study has made possible a better understanding of how transformational and transactional leadership styles and their components influence innovative behaviour. It is therefore recommended that future studies should pay more attention to the components of leadership styles when they examine the relationship between these strategic constructs.

### **Implication for management research and practice**

This study has practical implications for leadership and innovative behaviour at different levels within the organisation. It is important to be aware of the need to adopt a different style of leadership to improve employee's behaviour at different stages within the innovation process.

At the ideation stage a transformational leader should inspire and stimulate (transform) followers to think differently and achieve extraordinary outcomes. Leaders should pay more attention to articulating a vision that appeals to and inspires followers with optimism about future goals, and they should offer a meaning for the current task at hand. In addition, a leader must encourage followers to challenge the status quo and stimulate and encourage creativity by providing a framework in which followers can see how their role create value for the organisation. Most importantly, a leader should pay less attention to coaching or mentoring followers as individuals as this can have an adverse impact on employee's innovative behaviour.

A transformational leader is also expected to lead innovation efforts at the implementation stage by recognising the need to focus on transactional aspects of leadership style. During the implementation stage, a leader should be more concerned

with processes and reward followers when set goals are accomplished on time or ahead of time. Furthermore, a leader should communicate to followers about what ought to be done to receive a reward. However, when there is any deviation from the rules and regulations, a transformational leader is expected not to apply punitive measures, as this has no impact on innovative behaviour during the implementation stage. In fact, there is a stronger possibility of discovering new ideas by bypassing the rules, which can be helpful for the next cycle of the ideation stage.

### **Limitations and recommendation for future research**

This study was subject to some limitations. First, the study is cross-sectional and cross-sectional studies do not provide inference on causality. Second, the use of self-reporting may be subject to social desirability bias. However, this inherent problem of self-reporting is generally considered to be acceptable and cross-sectional studies are good for generalisation. Therefore there is a need for longitudinal research and it is suggested that future studies should consider extending the analysis to the ethical leadership style.

## **CHAPTER 8**

### **OBJECTIVE 7**

In this chapter, the seventh of the eight objectives is presented. The aim of this objective is to examine the nature of the relationship between leadership styles, organisational climate, innovations and organisational performance. The title of the article, as presented to the Leadership and Organisation Development Journal, is *“Towards a comprehensive model on the relationship between leadership style, organisational climate, innovation and organisational performance”*. The format presented in this chapter is in line with the guidelines for authors published by the journal. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **Towards a comprehensive model on the relationship between leadership styles, organisational climate, innovation and organisational performance**

## **Abstract**

**Purpose:** The purpose of this paper is to examine the nature of the relationship between leadership styles, organisational climate, innovations and organisational performance. **Methodology:** The study was quantitative in nature using questionnaires submitted by 231 participants from various companies in South Africa. The statistical analysis was based on Structural Equation Modelling using the path analysis. **Findings:** The results from Structural Equation Modelling (SEM) reveal that transformational leadership style influences the climate for innovation and organisational performance directly and innovation indirectly. Similarly, a direct relationship between transactional leadership style and organisational performance was found, but no direct or indirect relationship was found between transactional leadership style and innovation. **Practical implication:** The findings assist managers to better understand which leadership style to adopt when the aim is to increase organisational performance using innovation as an enabler. **Originality:** This is the first study that investigated the nature of the relationship between leadership styles, organisational climate, innovations and organisational performance taking into account the nature of innovation (i.e. incremental and radical) and the stage at which innovation is operating in the innovation process.

**Keywords:** leadership style, transformational leadership, transactional leadership, innovative behaviour, radical, incremental, innovation

## **Introduction**

Organisations by their very nature are designed to promote order and routine and as such they are inhospitable environments for innovation (Levitt, 2002). Yet, innovation is recognised by scholars as an essential component of sustainable competitive advantage (Gunday, Ulusoy, Kilic, and Alpkhan, 2008; Rosenbusch, Brinckmann, and Bausch, 2011; Caselli, Gatti, and Perrini, 2009). Innovation can increase organisational efficiency, productivity and ultimately improve competitiveness (Manafi and Subramaniam, 2015). To achieve that, leadership is needed which would provide

direction as well as create an environment where design and organisational cultural factors are congruent with each other (Birasnav, Albufalasa, and Bader, 2013; Garrison and Vaughan, 2013).

Leadership and its effect on innovation is most often studied from a transformational and transactional leadership styles perspective (Sabir, Sohail, and Asif Khan, 2011). A review of literature on the relationship between leadership style and innovation reveals at least three issues that warrant further research. First, the term innovation is sometimes used interchangeably with 'invention', which confuses the subject because invention is the conception of an idea, whereas innovation is the subsequent translation of invention into improved organisational performance (Trott, 2012). Linked to the aforementioned, Jansen, Vera and Crossan (2009) suggest a need for future studies that link leadership style and innovation to organisational performance. Second, while researchers have studied the relationship between transformational leadership styles, innovation and organisational performance extensively, minimal attention has been given to the effect of transactional leadership on innovation (Sethibe and Steyn, 2015a). Finally, the terms 'incremental' and 'radical' are used to describe the nature of innovation, but this differentiation is not found in studies that investigated the relationship between leadership style and innovation (Sethibe and Steyn, 2015b).

To address these challenges, the primary aim of this study is to systematically trace the causal path of both radical and incremental innovations on organisational performance by examining independently the influence of both transformational and transactional leadership styles. In doing so, the authors recognise that innovation has been widely acknowledged as hinging upon the complex social and psychological process, which invariably manifests itself in a form of climate in the organisation (Panuwatwanich, Stewart, and Mohamed, 2008). Therefore, a further aim of this study is to examine how the climate for innovation influences the relationship between these strategic management constructs, namely, leadership styles, nature of innovations and organisational performance.

This article commences with a brief theoretic background and a review of prior studies that investigated the relationship between leadership styles, innovation and



organisational performance, as well as the climate for innovation. Thereafter, the method used and the analysis are outlined and the results are presented and discussed. The article concludes with an interpretation of the results and implications for business leaders.

## **Theoretic background**

This section begins with a brief definition of each leadership style, nature of innovations, climate for innovation and organisational performance, followed by a review of prior studies that investigated the relationship between these constructs. Following this, twelve hypotheses are proposed.

### Leadership styles

Leadership is the ability to influence others to act in order to achieve goals that have been set (Elqadri, Suci, and Chandra, 2015). Building on the aforementioned, leadership style is the manner and approach of motivating people, providing direction in order to achieve the desired goal (Amirul and Daud, 2012). According to Belonio (2012) a style of leadership can either encourage or discourage employees and in turn can lead to increasing or decreasing the performance levels. Effective leaders often adopt styles that support employees, provide them with vision, instil hope and motivate them to think innovatively (Almutairi, 2016).

There are various styles of leadership, including transformational and transactional leadership. According to Gumusluoglu and Ilsev (2014) transformational leaders stimulate their followers intellectually, champion innovation and provide a strong vision within their firms. The transformational leader focuses on developing human capital that helps in the transforming of the organisation into an innovative organisation (Birasnav *et al.*, 2013). On the other hand, the transactional leader focuses on an individual's self-interest and motivates the individual through rewards (Golla and Johnson, 2013). As such, transactional leadership follows the rational and materialistic approach between a leader and a subordinate by describing a purposeful supply of rewards in return for goal achievement (Bushra, Usman, and Naveed, 2011; Khan, Asghar, and Arshad, 2014).

### Innovation

Innovation is the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of the new or improved product, process or equipment (Trott, 2012). Put differently, innovation refers to the overall process whereby an invention is transformed into a commercial product that can be sold profitably (Crawford and Di Benedetto, 2006). As such, the primary objective of innovation is the development of ideas and the modification of these ideas to promote long-term survival of the organisation (Mozhdeh, Wan, and Amin, 2011).

According to Pasche and Magnusson (2011), innovation can be classified as incremental or radical. Incremental innovation refers to minor changes in technology, simple product improvements, or line extension that minimally improve the performance of the existing product (Chen, Liu, and Cheung, 2014). In contrast, radical innovations involve major transformation of existing products, services or technologies that generally lead to obsolescence of prevailing product/services and technologies (Chandy and Tellis, 2000).

According to Munshi et al. (2005), leaders should strive to create an environment in which the appropriate innovation flourishes. Innovation scholars often describe the innovation process as being composed of two main stages, namely, ideation and implementation (King and Anderson, 2002; Axtell *et al.*, 2000). Oke *et al.*, (2009) analysed the linkage between leadership style and the innovation process and also concluded that the transactional leadership style encourages formal processes and as such ensures implementation, whereas transformational leaders are more likely to enhance creativity or idea generation. In this paper, the focus is on the elements that reflect the ideation stage of the innovation process.

### Climate for innovation

The term climate refers to a contextual situation at a given time and its association with the thoughts, feelings, and behaviour of the individual (Ngo, 2015). At organisational level, climate refers to the perceptions, feelings and values of staff regarding their workplace (Kazemi, Moghadam, and Soheili, 2012). More specifically, Van der Vegt, Van de Vliert, and Huang (2005) defined climate for innovation as a perception regarding the practices, procedures, and behaviours that promote the

generation of new knowledge and practices. This includes the degree to which management encourages employees to try new things and take risks without fear of prejudice (Choi, Moon, and Ko, 2013). There is a growing body of knowledge that suggests that organisational climate plays a decisive role in motivating employees to think creatively and fosters organisational performance by developing innovative products (Shah and Ali, 2011).

### Organisational performance

Organisational performance is often conceptualised as the actual output or results of an organisation against the desired goals and objectives (Short, Ketchen, Palmer, and Hult, 2007). According to Overstreet, Hanna, Byrd, Cegielski, and Hazen (2013) organisational performance can be measured using two distinct but related constructs, that is, the operational and the financial performance. Operational performance refers to the firm's ability to efficiently and effectively provide services to the customers. On the other hand, the financial performance refers to the monetary measure such as profitability, return on investment (ROI), return on sales (ROS) and operating ratios, to mention but a few.

After conducting an extensive literature review on organisational performance, Gentry and Shen (2010) recommended that both operational and financial performance should be used as a measure of organisational performance. However, the authors went further to argue that the sole use of operational or financial aspects is not necessarily wrong, but advised researchers to clearly define which aspect of organisational performance they intend to measure and then develop and test hypotheses about that.

## **Hypothesis development**

### Leadership style and innovation

Recent literature is abandoned with empirical studies that investigated the relationship between transformational and transactional leadership style and innovation. However, most studies focus on innovation at holistic level rather than understanding how the nature of innovation, that is, incremental and radical innovation, is influenced by different types of leadership style.

For example, Mokhber et al. (2015) investigated the effects of transformational leadership and its components on organisational innovation using data from 219 managers from 63 Iranian companies. The results of the study revealed that in general, transformational leadership style exhibits elements that foster organisational innovation. Similarly, Alsalamy et al. (2014) using a survey of 248 participants from the public and private sectors in Dubai, United Arab Emirates, also discovered that transformational leadership style correlated positively with intra-organisational innovation.

Golla and Johnson (2013) examined whether a relationship exists between transformational and transactional leadership styles and innovation commitment and output using 30 commercial software companies in the USA. The results of the study showed a strong relationship between transactional leadership style and new product development. Furthermore, the results showed a strong relationship between transformational leadership and the percentage of revenue from innovation. Accordingly, the following hypotheses are proposed:

*H1: Leadership style has a positive impact on innovation. Subsequently, the following sub-hypotheses are presented.*

H1a: Transformational leadership style has a positive impact on radical innovation.

H1b: Transformational leadership style has a positive impact on incremental innovation.

H1c: Transactional leadership style has a positive impact on incremental innovation.

H1d: Transactional leadership style has a positive impact on radical innovation.

#### Leadership style and organisational performance

Leaders who have transformational style provide individualised development, articulate a convincing mutual vision and accelerate employees' innovative thinking,

which in turn improves individual and organisational performance (Birasnav *et al.*, 2014; Wang and Howell, 2012).

For instance, Almutairi (2015) using 227 nurses from four hospitals in Saudi Arabia found a positive correlation between transformational leadership and job performance. Similarly, Pourbarkhordari, Zhou, and Pourkarimi (2016) examined the direct and indirect effects of transformational leadership style on job performance using the data collected from 202 employees in China and found that transformational leadership influenced job performance positively.

Khan *et al.* (2014) analysed the impact of both transformational and transactional leadership style on a firm's financial performance using a sample of 150 bank employees in Islamabad, Pakistan. The results of the study showed that transformational leadership style has a more significant impact on the firm's financial performance relative to transactional leadership style. As a result, the following hypotheses are proposed:

*H2: Transformational leadership style has a positive impact on organisational performance.*

*H3: Transactional leadership style has a positive impact on organisational performance.*

#### Innovation and organisational performance

Innovation is an important antecedent of organisational performance (Overall, 2015). To demonstrate this claim, Mafini (2015) conducted a study using 272 randomly selected employees of a South African government department and found a strong correlation between innovation and organisational performance. Similarly, Cortez, Ikram, Nguyen, and Pravini (2015) used various electronics companies from the USA, Japan, Korea and Taiwan to determine the impact of innovation on financial performance and the results revealed that innovation had a positive impact on the financial performance of the American and Taiwanese companies. In contrast, the results of the same study showed that for Japanese and Korean companies, financial performance lead to increased innovation. Using 98 small and medium enterprise

companies from Italy, Bigliardi (2013) showed that an increase in the innovation level increased financial performance. Based on these considerations, a positive relationship is expected overall between innovation and organisation performance.

*H4: Radical innovation has a positive impact on organisational performance.*

*H5: Incremental innovation has a positive impact on organisational performance.*

#### Leadership styles, organisational climate and innovation

Empirically, there is evidence that the climate for innovation moderates the relationship between leadership style and innovation. For instance, Hamidianpour *et al.* (2015) investigated the influence of organisational climate on employee creativity using a sample of 181 managers employed by SME's in Bushehr, Iran. The study found that organisational climate had a significant and positive impact on creativity of SME's employees.

In another study, Shanker, Bhanugopan and Fish (2012) examined how and in which ways elements of transformational and transactional leadership styles impact on the climate for innovation at an organisational level. They found a positive link between transformational leadership style and a higher level of creativity and innovation mostly at individual level. The study found that many aspects of the relationship between transformational and transactional leadership styles and the climate for innovation remain unexplored. As a result, the following hypotheses are proposed:

*H6: Leadership style has a positive impact on organisational climate. Subsequently, the following sub-hypotheses are presented.*

H6a: Transformational leadership style has a positive impact on organisational climate.

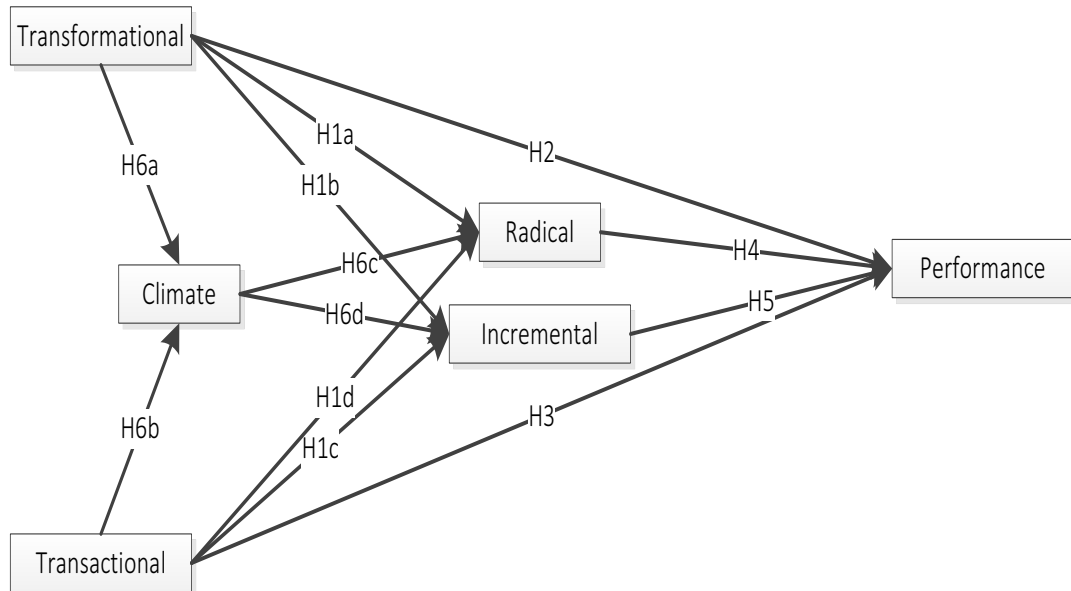
H6b: Transactional leadership style has a positive impact on organisational climate.

H6c: Organisational climate has a positive impact on radical innovation.

H6d: Organisational climate has a positive impact on incremental innovation.

## Conceptual framework

Taking into consideration the theoretic background as discussed in the foregoing sections, the conceptual framework depicted in Figure 1 is proposed.



**Figure 1:** Relationship between leadership, organisational climate, innovation and organisational performance

The conceptual framework lists transformational and transactional leadership styles, radical and incremental innovations and organisational performance. As such, this study is intended to test the indicated twelve hypotheses (H1a, H1b, H1c, H1d, H2, H3, H4, H5, H6a, H6b, H6c and H6d).

## Method

To test the hypothesised relationship, the survey questionnaire was employed and estimated the resulting model using Structural Equation Modelling (SEM). This section starts by describing the sampling and the method used to collect data, followed by a brief description of the instruments used to measure the constructs. The section concludes with a brief description of how the data were analysed.

### Sample and data collection

In order to test the research hypotheses, the quantitative cross-sectional research design was adopted. Data were collected manually in South Africa, using a survey

strategy. To be included in the study, participants needed to be employed by a South African organisation. In order to assess the leadership style of the chief executive officer (CEO), the respondents were relatively senior individuals in the organisation and interacted frequently with the CEO. The target group were Masters in Business students. These students were targeted primarily because of their proximity to CEOs and their seniority in the organisation.

Respondents were sourced from 112 companies and the data were collected through paper-based questionnaires in May 2016. The questionnaires evaluated leadership style of the CEO, the climate for innovation in the organisation, the respondents' own innovative behaviour and the perceived organisational performance. Of the 231 participants contacted, 146 returned the completed questionnaire, yielding a response rate of 63.2%.

In total, 53.4% respondents were male, compared to 45.9% female (missing data = 0.7%). Top management represented 33.8% of the respondents; 53.8% represented middle and junior management; 10.3% represented a wide range of professionals (e.g. specialists, skilled technical and academically qualified workers and supervisors); and 2.1% represented 'other' workers. As far as race is concerned, 82.2% marked African, 7.5% White, 2.7% Coloured and 7.5% Asian.

Almost all the respondents (99.3%) had a bachelor's degree or higher and 0.7% had diplomas. With regard to the reporting lines, 16.1% of the respondents reported directly to the CEO; 16.8% indicated that there was one level between them and the CEO; 21% two levels; 18.2% three levels; 17.5% four levels; and the rest (10.5%) had more than four levels. The majority of respondents (75.2%) indicated that their CEO had been in the role for more than two years.

### Instruments and measures

Existing measurement scales were adopted and where it was not appropriate to directly replicate existing scales, modifications were made to suit the research context. To assess leadership styles, the Multifactor Leadership Questionnaire (MLQ-FORM 6S) developed by Avolio, Bass and Jung (1995) was used. It is a self-report measure



containing 21 items, grouped into seven factors: four representing transformational leadership (idealised influence, inspirational motivation, intellectual stimulation and individual consideration); two being constructs for transactional leadership (contingent reward and management by exception) and one construct being for laissez-faire. Extensive research on the instrument indicated an acceptable reliability as well as validity (Antokonis *et al.*, 2003; Bono and Judge, 2004; Muenjohn and Armstrong, 2008). For the current study the alpha value for MLQ was .83 and for the subscales it was 0.94 and 0.83 for transformational and transactional respectively. The laissez-faire leadership construct was excluded in this study because the alpha value is below the cut-off point of 0.7.

For the measurement of organisational climate, the six-dimension scale developed by Amabile, Conti, Coon, Lazenby and Herron (1996) was used. The six dimensions are: supervisor encouragement; resources; team cohesion; openness to innovation; challenge; and autonomy. Each dimension consisted of four items assessed with a 7-point Likert scale ('1' = strongly disagree, '7' = strongly agree). The overall alpha value for the six dimensions of organisational climate was 0.83, which is deemed acceptable.

To measure radical and incremental innovation, the scale developed by Gilson, Lim, Innocenzo and Moye (2012) was adopted. Gilson *et al.* (2012) developed a seven item scale to assess the extent to which individuals characterise the ideas they generate at work as incremental (item three, Alpha = .91) and radical (item four, Alpha = .83). The scale was generated by first reviewing conceptualisations of creativity and exploration and exploitation, thereafter discerning the main themes that distinguish between two constructs such as search, discovery and fundamental for radical, in contrast to refinement and adaptation for incremental. Similarly, respondents were asked to rate them on a 7-point Likert scale ('1' = strongly disagree, '7' = strongly agree).

Organisational performance was measured with the custom developed three-item measure to assess perceived overall performance relative to competitors or organisations with similar services. The three-item measure assessed customer satisfaction, productivity and product/service innovation relative to competitors. The scale was developed after reviewing the instruments most frequently used to measure organisational performance when investigating the relationship between innovation

and organisational performance. Respondents were asked to rate their organisational performance relative to competitors over the last three years on the 5-point Likert scale ('1' = much lower, '5' = much better). The reliability of the three items measured for organisational performance was .93.

## Data analysis

The statistics software IBM SPSS 23.0 and Amos were used to perform descriptive statistics, correlations and Structural Equation Modelling (SEM) analysis. The results of the analysis are presented in the next section.

## Results

### Descriptive statistics and correlation test

The means, standard deviations, reliabilities and correlations between the study variables are presented in Table I. The Cronbach Alpha's are presented diagonally and in brackets.

Table I: Means, standard deviations, correlations and Cronbach's alpha

Measurment	Mean	SD	TLF	TSL	RI	II	OP	CL
Transformational leadership (TFL)	2.569	.844	(.929)	-	-	-	-	-
Transactional leadership (TSL)	2.614	.739	.800**	(.739)		-	-	-
Radical innovation (RI)	4.262	1.491	.086	.064	(.823)	-	-	
Incremental innovation (II)	5.059	1.283	.220**	.202*	.373**	(.813)	-	-
Organisational Performance (OP)	3.568	1.035	.470**	.408**	.295**	.461**	(.930)	
Organisational Climate (CL)	4.492	.993	0.508**	.429**	.169*	.465**	.582**	(.830)

\*\*p-value < 0.01; \*p-value < 0.05

From Table I, it can be seen that all the reliability coefficients are well above the acceptance level of 0.70. In addition, it can be observed that, based on cut-off scores

for a small correlation (Cohen, 1992), the magnitude of Pearson's correlation coefficient between leadership style and radical innovation is small. Also, though significant, the correlation between organisational climate and radical innovation is small. Radical innovation and organisational performance also reveal a small but strong correlation.

As far as all the other variables are concerned, the correlations are of a medium to high magnitude. Due to uneven distribution of the public and private sector respondents in the sample, an independent sample t-test was performed to assess if there are any differences in the responses. The results of an independent sample t-test showed no statistical significance differences ( $p\text{-value} > 0.05$ ) between the public and private sector scores for all constructs, namely: transformational and transactional leadership; radical and incremental innovation; organisational climate; and organisational performance.

#### Model assessment

The theoretical model was tested by applying SEM path analysis using IBM Amos. The model was tested in two steps: the significance and sign of the model relationship and the goodness of fit. Several fit indices are presented, focusing mainly on Root Mean Square Error of Approximation (RMSEA) and Chi-Square ( $X^2$ ) measure. RMSEA values of less than 0.05 correspond to a 'good' model fit and RMSEA values less than 0.08 are deemed as 'acceptable' model fit (McDonald and Ho, 2002), provided the Chi-Square value is non-significant. According to Schreiber, Stage and King (2006), the general rule for acceptable fit includes the Tucker-Lewis Index (TLI) and Comparative Fit Index (CFI) greater than or equal to 0.95. The structural model predicts organisational performance using leadership style, organisational climate and innovative behaviour. The models are presented in Table II below.

Table II: Models 1, 2 and 3

	$\chi^2$	p-value	df	CFI	TLI	RMSEA	$\Delta\chi^2$	$\Delta df$
Model 1	35.491**	0.000	2	0.895	0.216	0.340	-	-
Model 2	0.000	-	0	1.000	-	-	-35.491	-2
Model 3	0.571	0.989	5	1.000	1.041	0.000	-0.571	5

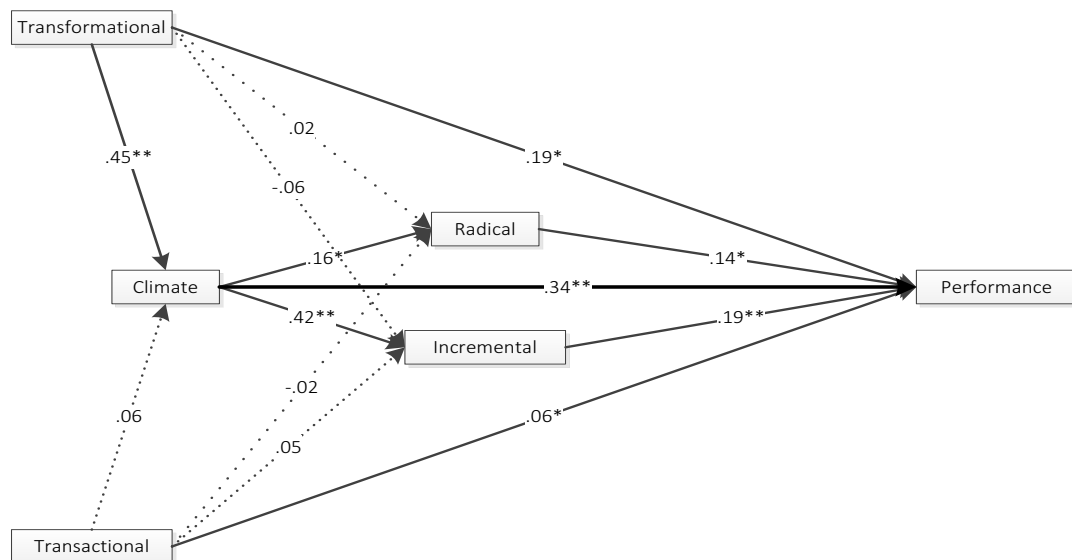
\*\*p-value < 0.01; \*p-value < 0.05

In Model 1, the structural model predicts organisational performance using leadership style, organisational climate and innovation as presented in the conceptual model. All the fit indices showed that the model did not fit the data adequately (RMSEA > 0.8; TLI < 0.95; CFI < 0.95;  $\chi^2 = 35.491$ ). Modification indices proposed the inclusion of a structural path from organisational climate to organisational performance.

In Model 2, the proposed structural path was included and the model improved but the probability level could not be computed because all degrees of freedom (df = 0) were used. The model showed that structural path from both leadership styles to radical and incremental innovation (see dotted line in Figure 2) were insignificant (p-value > 0.05). In addition, the structural path from transactional leadership style to organisational climate was also insignificant. In Model 3, all structural paths that were not statistically significant were removed from the model and the model fitted the data adequately (RMSEA < 0.5; TLI > 0.95; CFI > 0.95;  $\chi^2 = 0.031$ ).

#### Hypothesis model testing

The output of the SEM analysis is presented in Figure 2. The results of the SEM indicate that transformational leadership is positively related to radical innovation and negatively related to incremental innovation, but the results are not statistically significant (p-value > 0.05). This means hypotheses H1a and H1b are not supported. Similarly, transactional leadership style is positively related to incremental innovation and negatively related to radical innovation, but the results are not statistically significant (p-value > 0.05). Therefore hypotheses H1c and H1d are not supported.



**Figure 2:** Relationship between leadership style, organisational climate, innovation and organisational performance.

\*\*p < 0.01; \*p < 0.05

Both transformational and transactional leadership styles are positively and significantly associated with organisational performance, supporting hypotheses H2 and H3. In support of H4 and H5, both radical and incremental innovations are positively and significantly associated with organisational performance. When the relationship between leadership style and organisational climate are examined, the results reveal that only transformational leadership style has a positive and statistically significant impact on organisational climate (p-value<0.01). Transactional leadership reveals a positive impact on organisational climate, but the results are not statistically significant (p-value>0.05). Thus, H6a is supported and H6b is not supported.

Lastly, in support of H6c and H6d, the results reveal that organisational climate has a positive impact on both incremental (p-value<0.01) and radical innovation (p-value<0.05) and the results are statistically significant. These indicate that organisational climate mediates the relationship between leadership style and organisational innovation. In addition, the results reveal that organisational climate impacts positively on organisational performance and the results are strongly and statistically significant. The overall results are summarised in Table III below.

Table III: Summary of the results

Hypothesis	Standard coefficient	Significant number	Result
H1a: Transformational leadership style has a positive impact on radical innovation.	.020	.035	Rejected
H1b: Transformational leadership style has a positive impact on incremental innovation.	-.062	-.094	Rejected
H1c: Transactional leadership style has a positive impact on incremental innovation.	.050	.087	Rejected
H1d: Transactional leadership style has a positive impact on radical innovation.	-.049	-.024	Rejected
H2: Transformational leadership style has a positive impact on organisational performance.	.196	.241	Retained
H3: Transactional leadership style has a positive impact on organisational performance.	.055	.077	Retained
H4: Radical innovation has a positive impact on organisational performance.	.144	.100	Retained
H5: Incremental innovation has a positive impact on organisational performance.	.192	.155	Retained
H6a: Transformational leadership style has a positive impact on organisational climate.	.508	.598	Retained
H6b: Transactional leadership style has a positive impact on organisational climate.	.062	.083	Rejected
H6c: Organisational climate has a positive impact on radical innovation.	.169	.253	Retained
H6d: Organisational climate has a positive impact on incremental innovation.	.414	.535	Retained

## Discussion

Three major outcomes emerge from this study: first, the results reveal that transformational leadership style does not influence organisational innovation directly, but it indirectly influences organisational innovation by creating a conducive environment for organisational innovation to flourish. This is contrary to prior studies conducted by Mokhber *et al.* (2015) and Alsalami *et al.* (2014) that showed a direct positive relationship between transformational leadership style and organisational innovation. This study shows the importance of including organisational climate when investigating the relationship between transformational leadership style and organisational innovation.

Second, contrary to previous studies conducted in the USA (Golla and Johnson, 2013), the results of this study reveal that transactional leadership style has no impact on organisational climate and organisational innovation. The results further reveal that

transactional leadership style has a direct impact on organisational performance. Yet, while both transformational and transactional leadership styles contribute positively to firm performance, transformational leadership style has a much stronger influence on the performance of an organisation. This finding is in line with previous studies conducted in Pakistan (Khan *et al.*, 2014).

Third, although both radical and incremental innovations have a strong positive impact on organisational performance, the results reveal that organisational climate has a much stronger influence on organisational performance. These results suggest that although leadership style and organisational innovation impact positively on organisational performance, this can only be achieved only if a strong climate for innovation exists in the organisation.

Overall, the results indicate the importance of utilising both transformational and transactional leadership style to maximise organisational performance. However, if the objective is increase organisational performance using innovation as an enabler, then it is important for leaders to focus on a transformational leadership style in order to create an organisational climate which is conducive to employee's innovative behaviour and organisational innovation.

## **Conclusion**

A study was carried out to develop a comprehensive model explaining the relationship between leadership style, organisational climate, innovation and organisational performance to better understand the relationship between these constructs.

On the whole, several conclusions can be drawn from this study: first, the results of the study highlight the importance of organisational climate on the relationship between leadership style and innovation. Second, the results reveal that transactional leadership style has no direct or indirect effect on innovation during the ideation stage. This is consistent with the study conducted by Oke *et al.*, (2009) which concluded that transformational leadership style is more appropriate to foster the creative innovation process than transactional leadership style. Third, the results showed that organisational climate has more impact on incremental innovation than radical

innovation. This suggests that radical innovation is influenced by other organisational contexts that include provision of an environment such as encouraging risk-taking.

Finally, the results showed that in order to increase organisational performance, a leader should adopt both transformational and transactional leadership styles, depending on the stage of the innovation process. However, if the primary objective is to increase organisational performance utilising innovation as an enabler, then a leader should adopt a transformational leadership style.

### **Managerial implications**

The managerial implication of this study is twofold: first, the results emphasise the role of transformational leadership in creating a conducive environment for innovation to flourish. As this leadership style reveals long-term and short-term positive effects on organisational performance, directly and indirectly, strategically increasing a manager's transformational potential may well benefit the entire process of maximising shareholder value by increasing organisational performance. The results showed that the organisational climate plays a major role in increasing organisational performance. Thus an awareness of the manager's role in creating a favourable environment for innovation may be an area of positive investment for the organisation to improve performance.

Secondly, although the results revealed that transactional leadership had no significant direct or indirect impact on innovation, the results showed that this style of leadership does contribute positively to organisational performance. Thus organisations should encourage managers to adopt transformational and transactional leadership styles, particularly when the primary objective is to increase organisational performance. Therefore, managers should pay more attention to articulating a vision that appeals to and inspires followers, encouraging followers to challenge the status quo and most importantly, rewarding employees where necessary.

### **Limitations and recommendations for future research**

This has some limitations that have to be taken into account in interpreting the results. First, like similar studies on leadership styles, innovation and performance, this study



is cross-sectional and based on data from a single source and thus does not provide inference on causality. Second, the use of self-reporting may be subject to social desirability bias. Thus, a longitudinal study is recommended to tackle the question of the causal order of leadership style, climate, innovation and organisational performance.

## CHAPTER 9

### OBJECTIVE 8

In this chapter, the eighth of the eight objectives is presented. The aim of this objective is to analyse the top five retail banks in South Africa and to distinguish between distinct innovation strategies, namely, first-mover and fast-follower strategies and how these impact organisational performance. The title of the article, as published at the International Business Conference, is “*Innovation strategies and organisational performance: An empirical analysis into the South African banking sector*”. The format presented in this chapter is in line with the guidelines for authors published by the conference organisers. Minor alterations were made to the structure of the article for the purpose of creating consistency between articles.

# **Innovation strategies and organisational performance: An empirical analysis into the South African retail banking sector**

## **Abstract**

South African banks operate in a highly competitive market, hence a means of differentiation is of paramount importance. This paper analyses the top five retail banks in South Africa and distinguishes between distinct innovation strategies, namely, first-mover and fast-follower strategies and how these impact organisational performance. Accounting-based (return on assets [ROA], return on equity [ROE]) and market-based (price-to-earnings [P/E]) measures are used as a proxy for organisational performance. This study indicates that banks that adopt the first mover innovation strategy exhibit significant superior organisational performance when measured on ROE. The results further showed no significant difference between the two strategies when their organisational performance was measured in ROA and P/E. The results provide insight into the nature of the relationship between the innovation strategy adopted and the organisational performance. Notably, this study provides evidence that being the first mover in innovation is the best strategy in retail banking, if the primary goal of the organisation is to maximise shareholder returns.

Keywords: organisational performance, first-mover, fast-follower, banking

## INTRODUCTION

The best way to predict the future is to invent it (Kay, 2000). In support of this statement, innovation scholars live by the mantra “innovate or die” (Fein, 2014; Sharif, 2014; Wekerle and Oberbauer, 2016). Although innovation is viewed as an essential component for improving competitiveness and ensuring survival, business leaders are faced with a number of challenges that might inhibit their organisations in reaping the rewards of being innovators. Ulhøi (2012) states that the key to effective innovation is the firm’s strategic position, which relates to the choice of entry mode. This in turn refers to the innovation strategy that an organisation should adopt, while the other issue is concerned with how fast the organisation should enter the market, that is, as either the first-mover or the fast-follower.

The first-mover and the fast-follower strategies are the two distinct innovation strategies commonly found in literature (Chaudhuri and Singh, 2015; Fosfuri, Lanzolla and Suarez, 2013; Markides and Sosa, 2013; Wunker, 2012). According to Trott (2012), the first-mover strategy centres on the advantage gained by monopoly. In this case, the primary aim is to try to ensure that the product is launched into the market before a competitive product. In contrast, the fast-follower strategy enables the organisation to respond quickly to those companies that are first into the market. Organisations adopting the fast follower strategy need to be agile in manufacturing, design and development and marketing. Very often both strategies are followed by a company, especially when it is operating in a fiercely competitive environment (Trott, 2012).

A first-mover could acquire a competitive advantage through a monopoly, but could also make costly mistakes owing to a lack of information, learning and experience, whereas the fast-followers could benefit from a first-mover’s information revelations and learning opportunities, but they may face higher pre-emption costs (Hawk, Pacheco-De-Almeida and Yeung, 2013). Darman Mappangara and Simanjuntak (2014) point out that first-mover advantages arise from three primary sources, namely, technology leadership, creation of buyer switching costs and the pre-emption of assets.

The relationship between innovation and first-mover advantage, particularly the order of market entry, has long been well established in the literature (Tufano, 1989; Ulhøi, 2012; Doha, 2012; Okpara, 2011). Although a notable number of related research projects found a positive correlation between first-movers and organisational performance (Araiza, 2009; Carow, Heron and Saxton, 2004; Jing, 2005; Tufano, 1989; Vaaler, 1997; Zantout and Chaganti, 1996), others showed a mixed relationship or no relationship (Hawk *et al.*, 2013; Kim and Lee, 2011; Lopez and Roberts, 2002; Poletti, Engelland and Ling, 2011; Rhee, Cho and Kim, 1998; Ulhøi, 2012). Other studies pointed towards a so-called “paradox of first-mover”, whereby first-movers are displaced by fast-followers (Doha, 2012; Okpara, 2011). The aforementioned warrants further investigation.

This paper now continues with a discussion on the way in which the adopted innovation strategies could impact organisational performance. This paper focuses exclusively on retail banks operating in the South African market.

## **IMPORTANCE OF THE STUDY**

The relationship between the first-mover and the fast-follower innovation strategies and organisational performance is an important topic in economics and finance and has been investigated extensively. However, the results have been inconsistent (Alam, 2003; Doha, 2012; Okpara, 2011). This inconsistency has been attributed to a number of factors, including the research methodology, the variables used to measure innovativeness and the measures used to evaluate organisational performance. The research aims to bring clarity to this debate through a comprehensive analysis that considers the first-mover and fast-follower strategies as well as measuring organisational performance using ROE, ROA and P/E as a proxy.

A study conducted by Doha (2012) indicated that being the first-mover in innovation strategy is the best strategy in the pharmaceutical industry, but the fast-follower strategy is the best strategy in the computer and semi-conductor industries. This is mainly because technology innovations (computers and semiconductors) can be replicated in a short period of time, whereas innovations in the pharmaceutical industry are both technology and legislation driven, for example patents. It might, therefore, be

useful to advise South African business leaders, particularly those in the banking sector, about how innovation strategy relates to different business outcomes.

The impetus and importance of the research is thus twofold: at a methodological level, a new level of analysis is added to previous research by including additional variables to assess organisational performance and contextually and at application level, specific reference is made to banks in South Africa, an area which has not been investigated in the past.

## **LITERATURE REVIEW**

### Explaining innovation strategy

In its broader sense, a strategy is defined as a plan, method, or series of actions designed to achieve a specific objective (Grant, 2015). These series of actions can be achieved through strategies such as lower costs, differentiation or focus on a niche market or segment. In other words, strategy is a long-term plan of action that defines choices about how to reach certain objectives. Consistent with this definition, Abbing and Gessel (2008) defined innovation as part of the strategy which deals particularly with the growth of the organisation through the development of new products, services, processes or business models.

The term innovation is defined as something that is invented for the first time and is commercially successful (Hornby, 2010; Crawford and Di Benedetto, 2006). Thus innovation is associated mainly with first mover strategy. In other words, innovative companies are generally referred to as innovation leadership or first-mover organisations. This may explain why innovation is broadly seen as a crucial element of competitiveness, entrenched in organisational structures, processes, products and services within the organisation. The two most popular innovation strategies are first-mover and fast-follower (Trott, 2012).

According to Short and Payne (2008), the first-mover advantage (FMA) theory has developed in three streams. The basic isolating mechanism by which first-mover entrepreneurial rent can be protected from imitative competition has been identified as the first stream. A second stream relates to first level resources and capabilities that

allow the organisation to exploit FMA. A third stream involves the relationship between the environment and competitive advantage, based on the order of entry.

Innovation in new products and services enables the development of durable first mover advantage by supporting the creation of isolating mechanisms such as proprietary technology, switching cost inconvenience and resource pre-emption (Suarez and Lanzolla, 2005). For instance, the advantage could lie in a scarce resource that a first-mover may acquire, such as a prime location (Lieberman and Montgomery, 1988). These slow down competitive reactions and increase innovation lead time (Suarez and Lanzolla, 2005). As a result, first-movers can enjoy extended periods of prosperity before latecomers enter the market (Short and Payne, 2008).

Innovators can enjoy a temporary absence of rivals if there are exogenous forces, such as the protection of patents, the delay caused by necessary study or the registration of products with regulatory bodies that prevents imitators from imitating them quickly (Tufano, 1989). Arguably, entry barriers such as proprietary knowledge and patent protection, which allow first-movers to operate as pseudo-monopolies, provide greater value than entry barriers, which may take time to be activated, even if they have the potential to provide long-term benefits (Poletti *et al.*, 2011). However, the effectiveness of entry barriers in deterring competitor entry and the period during which first-movers are able to earn monopoly-like profits depends largely on the first-mover's ability to impede competitive reaction.

It is within the aforementioned framework that Nourayi and Suh (2015) cautions that in a competitive environment imitators can erode the profits of first movers by sharing and/or reducing the monopoly profits if the entry barriers are weak. D'Aveni (1994) further argues that every FMA will eventually evaporate, particularly in a hypercompetitive environment where the speed of technological changes is ever-increasing. Elche and González (2008) expand on this discussion, maintaining not only that superior efficiency levels are directly related to innovation strategy, but also that performance depends on various strategies that go beyond innovation.

Makadok (1998) argues that the purpose of strategy is not to build and then defend a significant sustainable competitive advantage, but instead to create a constantly changing series of small endeavours, temporary competitive advantages, thereby

keeping competitors off-balance by forcing them to continually respond to these endeavours. In fact, economic theory argues that a firm's business performance outcome depends on the type and the timing of the innovation, the intensity of competition and whether the firm is a first-mover, a fast-follower or a laggard in implementing a particular innovation (Koellinger, 2008).

Tellis and Golder (2001) argue that the firm that is first to market is believed to have enormous advantages in terms of success, acquiring enduring market share and long-term market leadership. The same views are supported by Jensen (2003), who argues that the firm will adopt a first mover entry strategy if its expected payoff exceeds the benefits of waiting. From a strategic management point of view, first-movers are motivated not only by being first to market, but also by building high barriers to competitive entry in order to deter competitors from entering the market, or at least delaying second movers (Poletti *et al.*, 2011).

Despite many decades of research on first-mover strategy, the answers to whether being the first to enter the market accrues a sustainable competitive advantage remain inclusive and sometimes contradictory (Li *et al.*, 2003). According to Rasmusen and Yoon (2012), uncertainty is the most important reason for adopting fast follower strategy. For instance, Rhee *et al.* (1998) demonstrated in detail how followers in the semi-conductor industry in Japan and Korea eventually achieved market dominance and ultimately outperformed first movers. Therefore, although being the first mover to market is generally associated with improved performance, empirical evidence shows that being the first mover in the market does not always sustain the advantage and may even be leapfrogged by fast followers (Koppel and Loffler, 2008). These inconsistencies can be attributed to the method used to measure organisational performance (Vaaler, 1997). Thus, understanding what organisational performance entails is very important in examining the relationship between innovation strategies and organisational performance.

### Organisational performance

The main aim of adopting the innovation strategy is to generate profit and increase shareholder value (Tufano, 1989). According to Cleff and Rennings (2012), first-mover advantage is the ability of a firm to outperform its competitors in terms of organisational



performance using similar or cheaper resources. However, management literature employs a number of different measures to evaluate organisational performance (Berger and Bonaccorsi di Patti, 2006). To measure organisational performance, it is important not to use a single measurement, but to use a multi-dimensional approach (Serfontein and Hough, 2011). However, despite the general consensus among scholars that organisational performance is a multi-dimensional construct, one of the most extensively used measures is the financial component (Gentry and Shen, 2010).

Most scholars prefer to use financial measures such as ROA, ROE, ROI, profitability and sales growth to assess financial performance (Cho and Pucik, 2005). Although accounting-based measures of performance may be affected by reporting distortions due to tax laws and accounting standards such as generally accepted accounting principles (GAAP), they are useful because they provide an objective performance measure (Campbell and Mínguez-Vera, 2008). Thus it is important to keep in mind that accounting measurement as an instrument for measuring financial performance has both strengths and weaknesses. To overcome the weaknesses presented by accounting-based measures, several market-related measures are proposed in order to account for the long-term benefits of innovation in an organisation.

Earnings per share (EPS) is the most popular market-related measure to assess organisational performance (Hult *et al.*, 2008; Likar *et al.*, 2014; Nawaz, Hassan & Shaukat., 2014; Tsao and Lien, 2013). The price-earnings (P/E) ratio is calculated by dividing share price by the EPS. Advocates of the P/E ratio argue that the strength of the P/E ratio is its ability to use current and historical data to predict the future. As such, investors widely use the P/E ratio as an indicator to predict future prospects.

#### Innovation strategies and organisational performance

Recent empirical studies have attempted to show that first mover strategy in innovation significantly contributes to superior organisational performance. In this context, Xi, Xi and Xi (2016), using survey data from 190 participants from financial services firms in Pakistan found a positive, but weak, relationship between service innovation and organisational performance. These results indicate the importance of analysing the innovation types when examining the relationship between innovation strategy and organisational performance. Similarly, Huang, Lin and Yen (2016) examined the

relationship between innovation, brand image and organisational performance and found that innovation has a positive effect on brand image and innovation.

Doha (2012) conducted an empirical study following a cross-sectional and longitudinal panel design among 227 public firms that competed on the basis of innovation and imitation in three manufacturing industries (computers, semiconductors and pharmaceuticals) in the United States. The results of the study demonstrated that imitation leads to future gains in shareholder value, but only in the computer and semiconductor industries. In sharp contrast, the study found that the financial market devalues firms that practice imitation in the pharmaceutical industry.

In a study based on data from American, Japanese, Korean and Taiwanese companies, Cortez, Ikram, Nguyen and Pravini (2015) conducted a comparative study between countries by examining whether companies that adopted first-mover innovation strategy outperformed fast-followers in terms of financial performance. The findings of the study revealed the positive impact of innovation on financial performance, but there was also a reverse relationship. A cross-country comparison for companies showed that innovation impacts the financial performance of American and Taiwanese companies. In contrast, for Japanese and Korean companies, the study found that financial performance leads to innovation.

More recently, Carvalho *et al.* (2016) examined the relationship between innovation and financial performance using earnings before interest, taxes, depreciation and amortisation (EBITDA), ROE and ROA as a proxy for organisational performance. The results indicate that companies that adopted a first-mover innovation strategy are able to sustain higher financial results than fast-follower companies. In the banking context, Lopez and Roberts (2002), using 24 banks operating in Costa Rica, found that first-mover innovation strategy is highly correlated with superior market share. In contrast, Alam (2003), using a survey of 138 product managers among commercial banks in the United States, showed that moderately innovative products are likely to be more successful than highly innovative and low innovative products.

Finding empirical studies on the innovation-performance relationship in retail banking in the South African context was difficult. Two major databases, namely, EBSCOhost and ProQuest were searched for articles that investigate innovation in retail banking.

On EBSCOhost, 47 databases were searched and no articles were retrieved. Similarly, On ProQuest, 47 databases were searched and no articles were retrieved. By academic standards, this demonstrates a gap in the body of knowledge.

#### Innovations in South African retail banking

Despite the lack of empirical studies that investigate the innovation-performance relationship in retail banking in the South African context, data on innovation in banking in South Africa is available. The Innovation Agency, in conjunction with System Logic, conducts an annual survey in South Africa to assess which bank is the most innovative bank in South Africa (Innovation Agency, 2011; 2012 and 2013). The most recent comprehensive study was conducted by the Innovation Agency in 2014 (see Figure 1). The study investigated which banks were most innovative between the period 2007 and 2014 and found that both FNB and Capitec maintain a strong leadership position in the banking sector.

The study investigated a number of aspects surrounding the level of innovation achieved by the banks as perceived from a local and end-user perspective. These include products, technology, marketing, customer centric, simplicity and an innovative culture. The survey was administered in a controlled manner, using survey questionnaires designed to be open-ended and comprised 325 respondents. The majority of respondents expressed how FNB is quick to respond to new technologies. Capitec received compliments regarding the ability to make banking easier, simpler to understand and transparent. Standard Bank was rated innovative mainly for their mobile banking applications; they are also considered to be the market leaders in Africa.

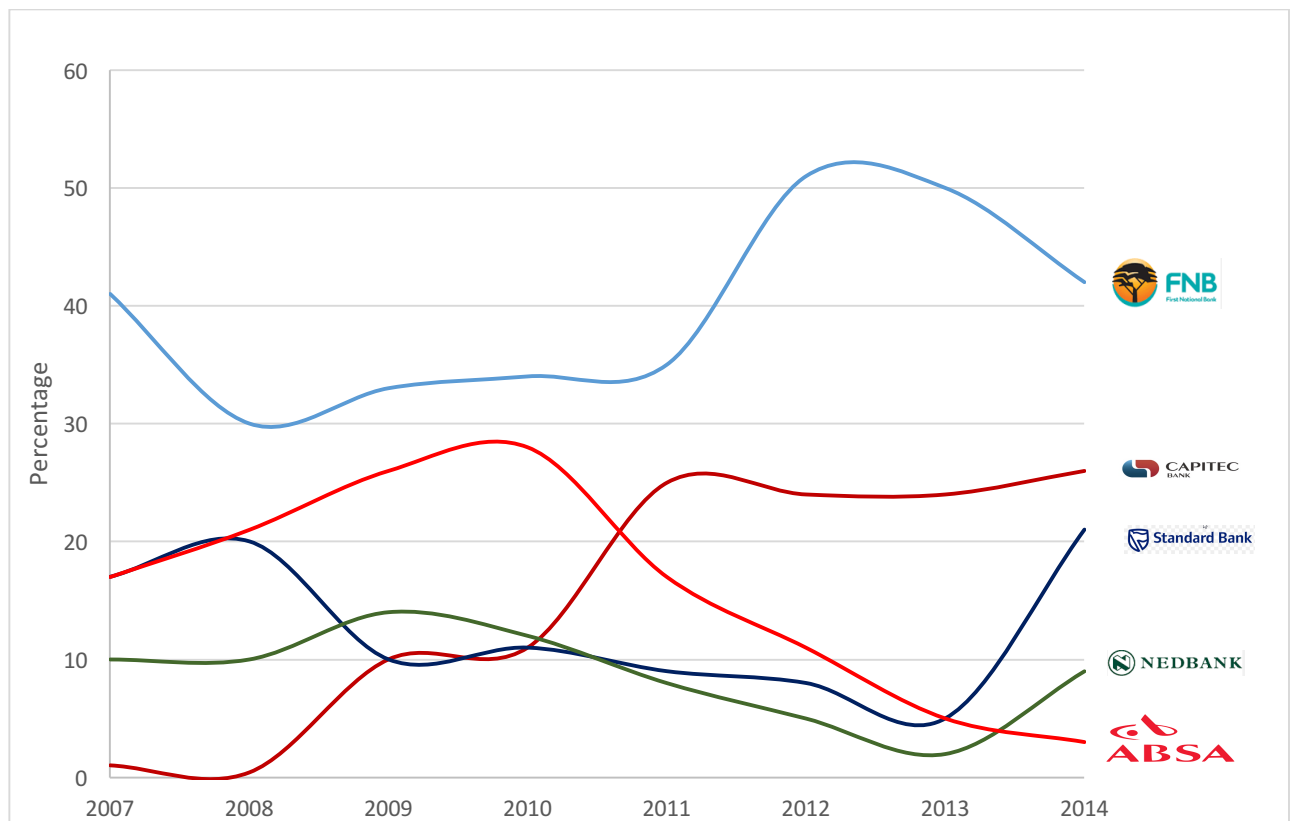


Figure 1: Most Innovative Bank

Adopted from the Innovation Agency (2014)

Overall, FNB is considered to be the most innovative bank among banks operating in South Africa. Although Capitec is considered to be second most innovative bank overall, Figure 1 shows that Absa was considered to be second most innovative bank between 2007 and 2010. The analysis of the data was therefore divided into two periods, 2007 to 2010 and 2011 to 2014.

### Hypothesis development

Against the backdrop of the literature review, it is expected that organisational performance may be influenced by the innovation strategy adopted by organisations. It may well be possible that this link is unique to the local banking sector. This led the researchers to develop a research question: is adopting the first-mover innovation strategy superior to a fast-follower strategy in the South African banking sector? ROA, ROE and P/E were used as a proxy for financial performance. As the positions of first-mover and fast-follower differed during the period under investigation (see Figure 1), the following hypotheses and null-hypotheses were formulated and tested:

**H1:** During the period between 2007 and 2010, first-movers in retail banking exhibit superior organisational performance.

**H1A<sub>0</sub>:** During the period between 2007 and 2010, there is no statistically significant difference between first movers and followers in terms of P/E.

**H1B<sub>0</sub>:** During the period between 2007 and 2010, there is no statistically significant difference between first movers and followers in terms of ROA.

**H1C<sub>0</sub>:** During the period between 2007 and 2010, there is no statistically significant difference between first movers and followers in terms of ROE.

**H2:** During the period between 2011 and 2014, first-movers in retail banking exhibit superior organisational performance.

**H2A<sub>0</sub>:** During the period between 2011 and 2014, there is no statistically significant difference between first movers and followers in terms of P/E.

**H2B<sub>0</sub>:** During the period between 2011 and 2014, there is no statistically significant difference between first movers and followers in terms of ROA.

**H2C<sub>0</sub>:** During the period between 2011 and 2014, there is no statistically significant difference between first movers and followers in terms of ROE.

**H3:** During the period between 2007 and 2014, first-movers in retail banking exhibit superior organisational performance.

**H3A<sub>0</sub>:** During the period between 2007 and 2014, there is no statistically significant difference between first movers and followers in terms of P/E.

**H3B<sub>0</sub>:** During the period between 2007 and 2014, there is no statistically significant difference between first movers and followers in terms of ROA.

**H3C<sub>0</sub>:** During the period between 2007 and 2014, there is no statistically significant difference between first movers and followers in terms of ROE.

## RESEARCH METHODOLOGY

### Method design and sample

This research was descriptive-quantitative in nature, using a population of five major retail banks in South Africa (FNB, Capitec, Standard Bank, Nedbank and Absa) and contained an analysis of existing public financial data (Annual Financial Reports). However, FNB is a subsidiary of FirstRand Limited and does not release its own annual financial data as an independent entity. Therefore, the results for FirstRand will be used to represent FNB.

### Data collection

Financial data was collected from INET BFA (from 2007 to 2014) for comparison purposes. INET BFA provides real-time information and historical financial and company information on South African listed companies. To ensure that the financial statement results were comparable, standardised financial statements were used rather than normal financial statements as published. Statements used were income statements, balance sheets and market-related data such as share prices and EPS that were required for calculating P/E.

### Measurement instruments

Following from previous studies (Fang *et al.*, 2011; Likar *et al.*, 2014; Yu-Fang, 2013), the two most popular accounting-based measures (ROE and ROA) and market-based measures (P/E), were used as a proxy for organisational performance.

The *ROE ratio* is defined as profit after taxation divided by shareholder equity.

$$ROE = \frac{\text{Profit after Taxation}}{\text{Equity}} * 100$$

The primary aim of ROE is to measure the benefits to shareholders according to their investment in a firm (Marx, 2004). ROE is thus a useful instrument for assessing financial performance, but it should be used together with other instruments.

The *ROA ratio* is defined as the profit after taxation divided by total assets.

$$ROA = \frac{\text{Net Profit}}{\text{Assets}} * 100$$

Where Net profit = Profit before interest and tax (EBIT) – Total profit extraordinary nature – Taxation

ROA is an accounting measure of a firm's financial performance based on income before tax and interest, and is an indicator of how profitable a firm is in relation to its assets (Marx, 2004). It shows how effective the managers are at generating revenue from the invested assets.

*Price-earnings (P/E)* is calculated by dividing share price by EPS. As a result, EPS has a direct influence on the P/E ratio, which in turn is used by the investment community as a measure of expected future returns.

$$P/E \text{ ratio} = \frac{\text{Market Share Price}}{\text{Earnings Per Share}} * 100$$

The P/E ratio measures how much investors are willing to pay per rand of current earnings (Firer, Roos, Westerfield & Jordan, 2008). In other words, the higher the P/E is, is often taken to mean the firm has significant prospects for future growth.

### Ethical considerations

The study used secondary data which is publicly available and as such confidentiality was not deemed necessary.

## **RESULTS**

Descriptive and inferential statistics are presented in this section. A descriptive analysis was conducted as part of the exploratory approach to analyse the data. In order to analyse the financial performance of the five banks, the non-parametric Kruskal-Wallis and Mann-Whitney U tests were used. Figure 1 showed FNB (a subsidiary of FirstRand Limited) and Capitec as the most innovative banks in South Africa and as such they were classified as first movers, while the fast-followers are Standard Bank, Nedbank and Absa. Three instruments were selected for determining the financial performance of banks, namely P/E, ROA and ROE.

## Descriptive statistics

A summary of financial performance data for all the banks is shown in Table 1 below, using overall mean, standard deviation, minimum and maximum values.

Table 1: Descriptive statistics (2007-2014)

Variable	Group	Mean	Standard deviation	Minimum	Maximum
Price-earnings ratio	FirstRand	10.41	1.49	7.13	11.89
	Capitec	14.30	3.96	8.39	21.47
	Standard	11.53	1.82	8.23	14.04
	Nedbank	10.32	1.75	6.55	11.80
	Absa	10.38	1.90	7.34	12.76
Return on assets	FirstRand	-0.85	0.75	-2.50	-.08
	Capitec	-11.46	7.85	-30.52	-6.67
	Standard	-1.20	0.45	-1.79	-0.20
	Nedbank	-1.42	0.22	-1.72	-1.14
	Absa	-1.32	0.32	-1.61	-0.77
Return on equity	FirstRand	23.39	6.61	14.29	35.43
	Capitec	21.25	3.34	16.55	27.65
	Standard	15.20	4.35	12.37	25.43
	Nedbank	14.60	3.10	10.91	19.96
	Absa	16.93	4.57	12.55	25.54

Source: Authors

Table 1 shows that Capitec has the highest P/E ratio mean of 14.30, suggesting that investors are willing to pay a premium for Capitec stock, mainly because the bank is expected to have a higher than average future earnings growth. In contrast, Capitec exhibits the lowest mean for ROA of -11.46, which suggests poor management of assets. However, the standard deviation for Capitec is the highest for both P/E and ROA ratios (3.96 and 7.85 respectively), suggesting there might be a possible outlier. Interestingly, Table 1 reveals that FirstRand has the highest ROE of 23.39, followed by Capitec with ROE of 21.39. These results suggest a possible correlation between the innovation strategy adopted by the bank (see Figure 1) and shareholder returns.

## Kruskal-Wallis results

In this section the aim is to determine whether the innovation strategy adopted by banks is significantly associated with certain variables that form part of organisational performance. In order to test this relationship, the non-parametric Kruskal-Wallis test



was used to test if significant differences exist between banks when measured by P/E, ROA and ROE. The results are presented in Table 2 below. The analysis of the data is divided into two parts, namely, results for 2007 to 2010 and for 2011 to 2014.

Table 2: Kruskal-Wallis

Period	Financial Performance Indicator	chi-square	df	p-value	Decision
2007-2010	Price Earning (P/E)	4.62	4	0.33	Retail $H_0$
	Return on assets (ROA)	9.69	4	0.04*	Reject $H_0$
	Return on equity (ROE)	4.58	4	0.33	Retail $H_0$
2011-2014	Price Earning (P/E)	5.42	4	0.27	Retail $H_0$
	Return on assets (ROA)	16.54	4	0.00*	Reject $H_0$
	Return on equity (ROE)	14.81	4	0.00*	Reject $H_0$

\* p-value < 0.05

Source: Authors

#### Results for the period 2007-2010

The Statistical Package for Social Science (SPSS) output shows that the Kruskal-Wallis statistics (chi-square) for ROA is equal to 9.69 with a p-value equal to 0.04. Therefore, the null hypothesis ( $H1B_0$ ), that there is no statistically significant difference between first-movers and fast-followers in terms of ROA, is rejected. Hence, it can be concluded that differences between ROA could be attributed to the innovation strategy adopted. For the same period (2007-2010), the Kruskal-Wallis statistics (chi-square) for P/E and ROE are 4.62 and 4.58 respectively with p-values of 0.33. Therefore, the null hypotheses ( $H1A_0$  and  $H1C_0$ ), that there is no statistically significant difference between first-movers and fast-followers when measured in P/E and ROE, are retained.

#### Results for the period 2011-2014

The SPSS output shows that the Kruskal-Wallis statistics (chi-square) for ROA and ROE are equal to 16.54 and 14.81 respectively, with a p-value equal to 0.00. Therefore, the null hypotheses ( $H2B_0$  and  $H2C_0$ ), that there is no significant difference between first-movers and fast-followers when measured in ROA and ROE, are rejected. Hence, it can be concluded that the differences between ROA and ROE could be attributed to the innovation strategy adopted. Similarly, it can be observed from Table 2 that the results of the Kruskal-Wallis statistics for the P/E ratio are not

statistically significant, with the p-value equal to 0.27 for period between 2011 and 2014. Therefore the null hypothesis  $H_{2A_0}$  is retained.

### Mann-Whitney U test results

To test the differences between the respective banks identified by the Kruskal-Wallis test, the Mann-Whitney U test was used and the results are presented in Table 3 below. Similarly, the analysis of the data is divided into two parts, namely, the results for 2007 to 2010 and 2011 to 2014.

Table 3: Mann-Whitney (M-W) U test

Period	2007-2010			2011-2014					
Group	ROA			ROA			ROE		
	Mean Rank	M-W U-value	p-value	Mean Rank	M-W U-value	p-value	Mean Rank	M-W U-value	p-value
FirstRand	6.50	0.00	0.02*	6.50	0.00	0.02*	5.75	3.00	0.14
Capitec	2.50			2.50			3.25		
FirstRand	4.25	9.00	0.77	6.50	0.00	0.02*	6.50	0.00	0.02*
Std. Bank	4.75			2.50			2.50		
FirstRand	6.00	6.00	0.56	6.50	0.00	0.02*	6.50	0.00	0.02*
Nedbank	4.00			2.50			2.50		
FirstRand	5.00	6.00	0.56	6.50	0.00	0.02*	6.50	0.00	0.02*
Absa	4.00			2.50			2.50		
Capitec	2.50	16.00	0.02*	2.50	16.00	0.02*	6.50	0.00	0.02*
Std. Bank	6.50			6.50			2.50		
Capitec	2.50	16.00	0.02*	2.50	16.00	0.02*	6.50	0.00	0.02*
Nedbank	6.50			6.50			2.50		
Capitec	2.50	16.00	0.02*	2.50	16.00	0.02*	6.50	0.00	0.02*
Absa	6.50			6.50			2.50		
Std. Bank	4.88	6.50	0.66	5.88	2.500	0.10	4.00	10.00	0.56
Nedbank	4.12			3.12			5.00		
Std. Bank	4.50	8.00	1.00	6.25	1.00	0.06	5.50	12.00	0.24
Absa	4.50			2.75			5.50		
Nedbank	3.50	12.00	0.24	5.25	5.00	0.38	3.50	12.00	0.25
<b>Absa</b>	5.50			3.75			5.50		

Note: Std. Bank: Standard Bank;

\* p-value < 0.05

Source: Authors

### Results for the period 2007-2010

The results of Table 3 indicate that there is a statistically significant difference between FirstRand and Capitec when measured using ROA with p-value = 0.02, U = 0.00 at a significance level of 5%, with FirstRand outperforming Capitec. Furthermore, Table 3

shows that there is a statistically significance difference between Capitec and the other three banks, namely, Standard Bank, Nedbank and Absa when measured using ROA with the p-values = 0.02 and U values = 16, indicating that Standard Bank, Nedbank and Absa outperformed Capitec. The results are in line with the findings of the study conducted by the Innovation Agency (2014), which showed Capitec trailing behind the other four banks in terms of innovativeness (see Figure 1).

#### Results for the period 2011-2014

When ROA was analysed, the results of Table 3 indicate a statistically significant difference between FirstRand and Capitec with the p-value = 0.02, U = 0.00 at a significance level of 5%. Furthermore, there a statistically significance difference between Capitec and the other three banks, namely, Standard Bank, Nedbank and Absa with the p-values = 0.02, U values = 16.00 when measured in ROA, with Capitec outperformed by all three banks. This finding is in sharp contrast to the findings of the study conducted by Innovation Agency (2014), which showed Capitec leading the other three banks (Standard Bank, Nedbank and Absa) in terms of innovativeness (see Figure 1). These results indicate that there is no conclusive evidence that an increase in innovativeness will lead to superior financial performance when measured in ROA.

When ROE was analysed, the results (Table 3) showed no statistically significant difference between FirstRand and Capitec with the p-value = 0.14, U = 3.00. However, the results further showed that there a statistically significance difference between FirstRand and the other three banks, namely, Standard Bank, Nedbank and Absa with the p-values = 0.02, U values = 0.00, with FirstRand outperforming all three banks. Similarly, the results further showed that there is a statistically significance difference between Capitec and the other three banks, namely, Standard Bank, Nedbank and Absa with the p-values = 0.02, U values = 0.00, with Capitec outperforming all three banks. These results are in line with the findings of the study conducted by Innovation Agency (2014), which showed Capitec was second after FirstRand in terms of innovativeness (see Figure 1). In other words, the results indicate that generally first movers exhibit superior ROE than fast-followers.

### Results for the period 2007-2014

The overall results for period between 2007 and 2014 are also presented in Table 3. The results of Table 3 reveal no statistically significance differences between banks when measured in P/E. Therefore, the null hypothesis  $H3A_0$ , that there are no statistical significant differences between first movers and followers when measured in P/E, is retained. The results in Table 3 further show that although there was no statistically significance difference between banks when measured in ROE between 2007 and 2010, there was a statistically significance difference between banks between 2011 and 2014. Furthermore, the results in Table 3 reveal a statistically significance difference between banks when measured in ROA for the two periods under investigation. Therefore, the null hypotheses  $HBA_0$  and  $H3C_0$ , that there are no statistically significant difference between first-movers and fast-followers when measured in P/E and ROA, are rejected.

## **DISCUSSION OF RESULTS**

The discussion of results in this section will focus on the differences between first-movers and fast-followers in terms of organisational performance, arranged according to the instruments used to assess organisational performance, namely the P/E ratio, ROA and ROE.

### Price-earnings (P/E)

The descriptive statistics showed the mean score for Capitec is slightly higher than that of FirstRand, Standard Bank, Nedbank and Absa. However, the results for the Kruskal-Wallis test were not statistically significant for the two periods under investigation (2007 to 2010 and 2011 to 2014), indicating that innovation is not a statistically significant predictor of P/E. In economic terms, this result suggests that there is no significant difference between the stocks of first-movers and fast-followers relative to earnings. This is consistent with Selby's empirical study (2010), which showed that innovation investments have no impact on EPS.

### Return on assets (ROA)

ROA is widely used to detail a company's return on the total of its committed financial resources. The descriptive statistics showed that the mean score of Capitec is relatively lower than the mean score of the other four banks. Similarly, the empirical results for ROA indicated statistically significant differences in organisational performance among the banks. The empirical results reveal a positive direct correlation between first-movers and fast-followers for the period 2007 to 2010 when measured by ROA, with first-movers outperforming fast-followers. In contrast, the analysis of the results for the period 2011 to 2014 indicated mixed results between first-movers and fast-followers when measured in ROA.

These results suggest that the relationship between innovativeness and organisational performance is inconclusive. This is contrary to the study conducted by Cho and Pucik (2005), which found a positive relationship between innovativeness and firm performance when measured by ROA. This can be attributed to the challenges presented by GAAP. According to Smith (2007), GAAP does not adequately handle the research and development (R&D) expenditures. The problem is that GAAP forces the immediate expense of R&D investment, which presents a challenge due to the time lag between innovation expenditure and the effect on financial performance, particularly because there are no accompanying assets or capitalisation.

### Return on equity (ROE)

Return on equity (ROE) measures the benefits for shareholders of their investments in a firm (Marx, 2004). It relates the earnings left over for equity investors after debt service costs have been factored into the equity invested in the assets (Alexander and Nobes, 2010). In other words, ROE for a company is a composite return on all the assets, which include both cash and operating costs. The empirical results revealed no significant differences between banks for the period 2007 to 2010. When the period 2011 to 2014 was analysed, the results showed a positive correlation between ROE and the bank that adopted a first mover innovation strategy, indicating that it is better for investors to invest in banks that pursue innovation as part of the strategy rather than banks that adopted fast follower strategies. This result is in line with the study by

Cho and Pucik (2005), which measured the effects present in their innovation-quality-performance model and found a positive relationship between innovativeness and firm performance.

## **CONCLUSION**

Innovation strategy decision-making has become a key element in a bank's strategy and future planning. Given this growing importance of innovation strategy in retail banking, the findings of this study highlight some of the key issues relating to innovation. In particular, the results relate to innovation by strategic choice in the banking sector.

The extant literature has touted leadership innovation strategy as a tool for improving a firm's financial performance and maximising shareholder value. However, the results of the study relating to the banking sector suggest that this is not always true. This is consistent with the school of thought that argues that no one strategy is the best and that the fast-follower may also achieve a high level of performance, mainly because first-to-market firms do not necessarily retain their dominant market position for long. Thus, the conclusion that can be drawn from this study is that the decision about which innovation strategy to adopt in the banking sector should be driven by the strategic goal of the organisation. If the main goal for the bank is to attract shareholders, then the bank should adopt the first-mover innovation strategy.

## **MANAGEMENT IMPLICATION**

These results indicate that the first-mover strategy in innovation is not a significant predictor of P/E and ROA in retail banking, suggesting that the market does not necessarily react to or reward banks for leading with innovation activities when measured in P/E and ROA. In contrast, these results show with some degree of confidence that the first mover strategy in innovation is a significant predictor of ROE. In other words, there is a positive correlation between the banks that adopt first-mover innovation strategy and shareholder returns. Overall, the findings of this study provide valuable information to managers of the retail banking sector and investors. The study suggests that if the intention of the managers is to increase revenue by effectively managing the firm's assets or to improve future earnings growth, then the first-mover innovation strategy is not necessarily the best strategy. However, if the objective is to

increase shareholder value, then the first-mover innovation strategy should be adopted.

## **LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH**

The study was limited to South African retail banks, using a relatively small target population, which restricted the conclusions to the South African setting and did not allow the results to be generalisable. Secondly, the design of the research focused on financial performance as a proxy for business performance and did not include other organisational performance measures such as customer satisfaction, an increase in the number of customers, an increase in customer loyalty and improved New Product Development capabilities. Nevertheless, the financial analysis is of great interest, because so few metrics are available to measure the impact of innovation, particularly innovation that goes beyond new products and services (Chapman *et al.*, 2008).

The main goal of the research was to determine whether being a first mover in innovation is the best strategy in retail banking. The emphasis was on a single sector in which greater homogeneity of context can be achieved to address the concerns of broad application versus perfect suitability for narrow groups. It also addressed the concern of country-specific characteristics and regulations, which were identified as the main reasons for conflicting results.

Future research should extend the topic beyond the South African borders and should search for a better understanding of the dynamics of different types of innovation (payments and customer experience) and its nature (incremental and radical). It is, however, very important that future research confines the scope of the research to retail banking owing to its unique characteristics.

## CHAPTER 10

### CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

The conclusions are presented in this chapter, followed by a discussion on the limitations and achievements of the study. The summary of contribution is clearly stated (10.4). Thereafter, recommendations are made, directed firstly to researchers and then to managers and innovation practitioners. The chapter concludes by suggesting possible future studies to researchers.

#### 10.1 Conclusions

Conclusions are presented on the different objectives of the literature reviews and the empirical investigations and then integrated into a cumulative integrated summary.

##### 10.1.1 Conclusions concerning the literature review

Through the literature review, gaps were identified in the ways the relationship between leadership style, organisational climate, innovation and organisational performance are presented in the existing body of knowledge.

**Objective 1** examined the published scientific knowledge referring to studies that investigated the relationship between leadership style, innovation and organisational performance. Seven articles were found and the constructs were comprehensively defined.

The literature reviewed revealed a fragmented approach in studies that investigated this relationship. From the seven articles found, 26 hypotheses investigated the relationship between leadership style, innovation and organisational performance. When analysed it was found that 11 hypotheses tested the relationship between leadership style and organisational performance, nine hypotheses tested the relationship between leadership style and organisational innovation and six hypotheses tested the relationship between organisational innovation and organisational performance. The aforementioned demonstrates the disjointedness of the present research.

The results reveal overwhelming evidence that the transformational leadership style is positively associated with innovation. It was also found that, in most cases, innovation



was positively associated with organisational performance. Although some studies found a relationship between transactional leadership style and innovation, more studies found no relationship between transactional leadership and organisational performance. Interestingly, the studies that show no relationship between transformational leadership and organisational innovation also reveal a statistically significant positive relationship between transactional leadership and organisational innovation. In most cases, the reported relationship between transformational leadership and innovation was stronger than that between transactional leadership style and innovation.

From the research conducted relating to Objective 1, it can be concluded that little research has been done on these constructs. If the main aim is to improve organisational innovation, managers should consider adopting a transactional leadership style. Furthermore, if the main aim is to improve organisational performance, managers should consider adopting a transformational leadership style. Thus, both transactional and transformational leadership styles are considered to be the drivers of organisational success, but the relationship between these constructs is complex, so the need for more complex modelling is clear, given the aforementioned dynamics between the constructs.

The literature review relating to **Objective 2** focused on the published scientific knowledge from studies that investigated the relationship between organisational climate, innovation and organisational performance. After consulting 96 databases seven articles were found. It is interesting to note that, given the search strategy covering these three constructs, definitions for innovation and organisational performance differed from those found in Objective 1. This demonstrates the idiosyncratic nature of definitions and the need for standardised definitions to be specific when defining concepts.

From studying the reported models, it was concluded that organisational climate influences the level of innovativeness in the organisation. The relationship between organisational climate and innovation is, however, mediated by other factors, including innovation strategy, firm size, leadership style and support for innovation. Similar to the findings in Objective 1, the study further established that innovation influences organisational performance positively. This demonstrates that organisations can

create value by promoting a climate for innovation to increase innovation and ultimately to improve individual and organisational performance. The conclusion derived from Objective 2 is that an effective innovation strategy can be achieved only if a strong climate for innovation exists in the organisation.

In **Objective 3**, the nature of the methods used in empirical studies that linked the variables discussed under Objectives 1 and 2 was analysed. In other words, the study reported on the methods used in empirical studies that investigated the relationship between leadership style, innovation and organisational performance on one hand, and organisational climate, innovation and organisational performance on the other hand. The articles identified were analysed with the aim of identifying standard procedures used in this field of study and assessing them critically. The findings showed that in many respects, most of the studies did not comply with the standard methodological protocols as set out in highly ranked journals. Most evident was a lack of sufficient articulation on the research paradigms used, inadequate reporting on the nature of the population and sampling methodology and an absence of uniform measures of the construct under investigation. Few guidelines are presented on decision-making strategies relating to reported statistical results and limited studies acknowledge ethical matters.

Notwithstanding the above shortcomings, the study revealed that a sample size of approximately 100 respondents is deemed to be acceptable when Structural Equation Modelling (SEM) is used. In addition, an analysis of the articles showed that most studies that investigate the relationship between these constructs are quantitative in nature, using self-report questionnaires.

This analysis revealed important limitations in present studies that should be avoided. However, the analysis also provided some structure and guidelines to build into the present research, by aligning it to the current body of knowledge, using the same or complementary measuring instruments and statistical methods.

In **Objective 4**, the psychometric instrument used to measure the nature of innovation was analysed in order to gain a deeper understanding of the concepts of incremental and radical innovation. The review focused on the standardised instruments used in prior studies to measure innovation and how authors differentiated between

incremental and radical innovation items. The findings revealed that no universally accepted measurement instrument exists for the measurement of radical and incremental innovation. An analysis of the content of the different instruments revealed that incremental innovation instruments captured elements such as “extension”, “adaptation” and “incremental improvement” relating to existing processes, services or products. On the other hand, radical innovations carried connotations such as “completely new”, “major technology advance”, “breakthrough”, “new to the market”, “novel”, “substantially different”, “fundamental”, “revolutionary” and “discovery”. It was concluded that the authors of these instruments are largely in agreement on the elements that constitute radical innovations. As such, it is recommended that future research should attempt to develop a universally accepted instrument to measure innovation. Uniformity will allow future researchers to contribute to the development of the existing body of knowledge.

In **Objective 5**, the instruments most frequently used to measure organisational performance when investigating the relationship between innovation and organisational performance were examined. The study revealed that profitability, sales growth and return on assets (ROA) were preferred as indicators of financial performance, whereas market share, customer satisfaction and productivity are the most favoured non-financial performance indicators by researchers. In 29 studies financial performance was the only measure whilst in five others non-financial performance was exclusively preferred. Thirty-seven studies included data on both financial and non-financial measures. Non-financial measures were mostly in the form of surveys. In line with Gentry and Shen's (2010) assertion, it could be concluded that although no specific measure of organisational performance is necessarily superior, researchers should always clearly define which aspects of performance they intend to study and measure that. This will allow future researchers to build on earlier work.

The abovementioned five objectives set the stage adequately to proceed with the empirical investigation. The empirical investigation was aimed at developing and testing a comprehensive model on the relationship between leadership style, organisational climate, innovation and organisational performance.

### 10.1.2 Conclusions concerning the empirical investigation

The empirical investigation succeeded in providing, in a quantitative manner, a broader and more comprehensive picture of the relationship between leadership style, organisational climate, innovation and organisational performance. This was achieved by achieving three separate objectives. Achieving these empirical objectives addressed several gaps identified in the literature review.

From the results pertaining to **Objective 6**, it is evident that it is useful to utilise both transformational and transactional leadership styles to enhance employees' innovative behaviour. It is most important to report that transformational leadership, as found in the literature, is a slightly more important driver of innovation than transactional leadership.

When the dimensions of transformational leadership are observed in more detail, most followers revealed that inspirational motivation and intellectual stimulation have the most influence on innovation. From the transactional perspective, contingent reward related most with innovation, suggesting followers who are rewarded for their efforts and recognised for good performance are more inclined to be innovative.

It is important to note in Objective 6 that the empirical results sketch leadership style as a complex phenomenon whereby not all elements of transformational or transactional leadership style present a straightforward influence on followers' innovative behaviour. Nonetheless, it is concluded that a transformational leadership style is generally the most effective style to promote innovative behaviour. As such, leaders are urged to be transformational in their interactions with subordinates.

A model more complex than any of those presented in Objectives 1 and 2 is presented in **Objective 7**. This depicts the nature of the relationship between leadership style, climate, innovation and organisational performance, illustrated in Figure 1. The model showed a clear link between organisational climate and innovation as well as a link between organisational climate and organisational performance.

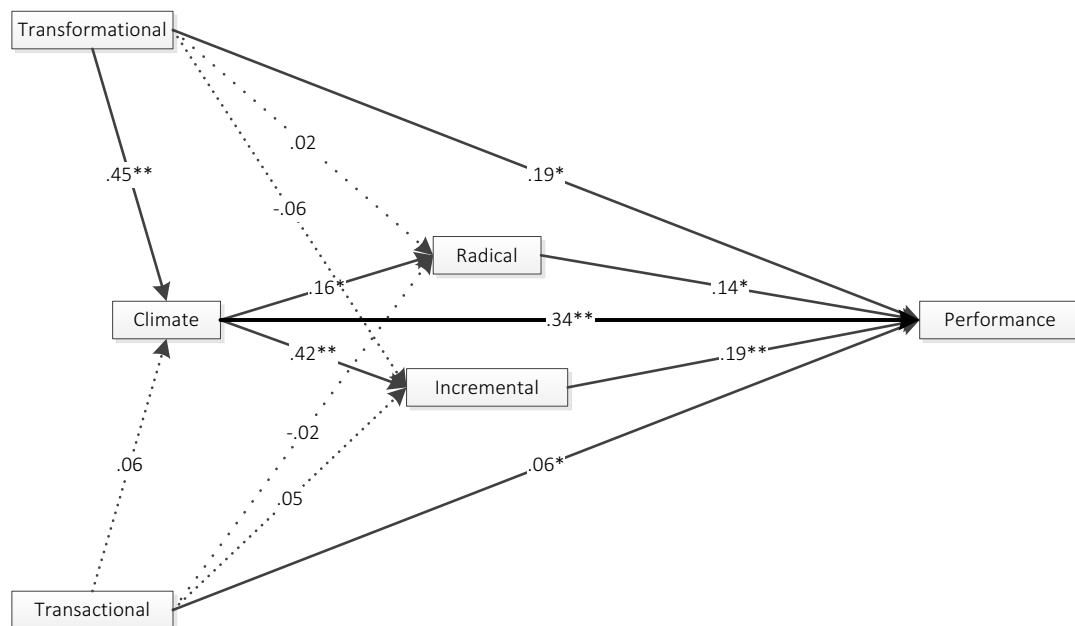


Figure 1: A model depicting the relationship between leadership style, organisational climate, innovation and organisational performance.

\*\*p < 0.01; \*p < 0.05

Interestingly the model shows that neither the transformational leadership style nor the transactional leadership style is appropriate to directly foster innovation. However, the results revealed that a transformational leadership style has an indirect effect to innovation, and this is through the climate that it creates. In other words, if the objective is to increase organisational performance using innovation as an enabler, then it is thus important for leaders to focus on a transformational leadership style in order to create an organisational climate that is conducive to innovation.

These findings depart from what was reported with Objective 1 (prior studies on leadership style, innovation and performance) and Objective 6 (an empirical study from Dataset 1), and suggest that the leadership style-innovation link is not direct. This makes a valuable contribution by demonstrating that this link is not direct but rather occurs through organisational climate. The findings support the conclusion drawn in Objective 2 (prior studies on organisational climate, innovation and performance), which stated that an effective innovation strategy can be achieved only if a strong climate for innovation exists in the organisation. The findings further downplay the effect of transactional leadership on the leadership style-innovation relationship. This

study is justified as it demonstrates how complex models provide a deeper insight into this phenomena.

In **Objective 8**, the nature of the relationship between innovation and organisational performance was examined using objective measures. It is evident that innovation impacts positively on organisational performance only when a certain objective measure of organisational performance is used. The results revealed that innovation has a significant impact on organisational performance when measured in return on equity (ROE), but no relationship was found when return of assets (ROA) and price earnings (P/E) were analysed. It can be concluded that if the main goal of the organisation is to attract shareholders by increasing shareholder value, then the organisation should aggressively adopt innovation as part of organisational strategy.

## **10.2 Cumulative summary and concluding remarks**

A literature search was conducted to gain a better understanding of the relationship between leadership style, organisational climate, innovation and organisational performance. It was concluded that scholars often study these constructs in isolation with little reference to all four constructs in the same study.

Despite the limited literature available on these constructs, it was possible to gain a better understanding of the concepts and that allowed the researcher to define these constructs comprehensively. The synthesis of the articles that investigated the relationship between “leadership”, “innovation” and “performance” showed that transactional leadership style is more effective in driving innovation, whereas transformational leadership style is more effective in improving organisational performance. The synthesis of articles that investigated the relationship between “climate”, “innovation” and “performance” revealed that an effective innovation strategy can be achieved only if a strong climate for innovation exists in the organisation. This finding reaffirmed the importance of and the need for research into all four variables in one study. It was then concluded that a model of the relationship between leadership style, climate, innovation and organisational performance is needed and will contribute significantly to the current body of knowledge. The literature review thus justified the design and the method adopted for the empirical study.

Before the conceptual model explaining the relationship between these constructs was developed, particular attention was given to the measures of innovation and performance, as well as the method used in previous studies, as from the literature review, these seem to be problematic. The analysis of the method used in prior studies revealed standard procedures in conducting such research as well as providing a clear picture of what is an acceptable procedure to follow when conducting a study on these constructs. Further analysis provided some understanding of what constitutes “radical” and “incremental” innovation and provided guidelines on the most effective approach for measuring organisational performance.

The aforementioned analysis provided a sound basis for the development of a conceptual model explaining the relationship between leadership style, climate, innovation and organisational performance. Firstly, a measurement model of the relationship between the components of transformational and transactional leadership style and innovative behaviour was developed and tested. The results confirmed that both transformational and transactional leadership drive employee’s innovative behaviour in the organisation. More importantly, the results showed that not all components of transformational and transactional leadership drive innovative behaviour. It was therefore concluded that, as found in prior studies, transformational and transactional leadership styles are both necessary to drive the innovation strategy.

Secondly, a path analysis was used to test a comprehensive model of the relationship between leadership style, climate, innovation and organisational performance. The results revealed the link between transformational leadership, innovation and organisational performance. Contrary to previous findings, the transactional leadership style-innovation relationship did not yield in this study. The results reaffirmed the findings of the literature review by showing the importance of organisational climate in fostering innovation and organisational performance. Central to the results is that the relationship between transformational leadership and innovation is indirect, and that this occurs through organisational climate.

The aforementioned model was developed based on the perceptions of employees. To mitigate that, an effort was made to ground the model in more “objective” data, thus part of the model was tested using publicly available financial data. The study succeeded in showing the positive relationship between innovation and organisational

performance. This additional step demonstrated that parts of the model presented in this research can be validated using “objective” data

### **10.3 Limitations and achievements**

This study was subject to some limitations. Firstly, the study used cross-sectional data and cross-sectional studies do not provide inference on causality. However, by applying path analysis, this limitation was mediated to some extent.

Secondly, the use of self-reporting may be subject to social desirability bias. However, this inherent problem of self-reporting is generally considered to be acceptable. This limitation was also moderated by using perceived organisational performance as well as “objective” financial data.

Thirdly, the study was limited to the South African context, which restricted the conclusions to the South African setting. Although this constitutes a limitation, the study allowed, with some degree of confidence, for the results to be generalised to other countries with similar characteristics. This research responded to a call for future studies on these constructs in developing countries.

### **10.4 Summary of contribution**

This research made a valuable contribution to the body of knowledge regarding the nature of the relationship between leadership style, organisational climate, innovation and organisational performance. Although the results are not necessarily representative of all South African companies, they still represent a large number of companies – more than those found in similar research. The results can therefore be used as a point of reference in future studies on developing countries.

At a theoretical level, as far as could be determined, this is the first research that investigated the relationship between leadership style, organisational climate, innovation and organisational performance, taking into account the nature of innovation, that is, incremental and radical. Furthermore, the investigation of leadership style at the components level provided a better understanding of the nature of the relationship between these constructs.



As part of the contribution to the body of knowledge, papers from this study are published in the following journals and academic conferences:

#### Journal articles

- International Journal of Innovation Management
- South African Journal of Economic and Management Sciences
- South African Journal of Entrepreneurship and Small Business
- Journal of Entrepreneurship and Innovation in Emerging Economies

#### Academic conferences

- International Business Conference (IBC)
- International Conference of Business and Management Dynamics (ICBMD)

On a practical level, this research provides valuable insights for business leaders. Given the outcome of this research, managers are better equipped to enhance innovation and improve the organisational performance of their organisation.

The following recommendations focus on these techniques.

### 10.5 Recommendations

The research has several practical implications for managers and innovation practitioners.

In **Objective 1**, managers are alerted to be aware of the importance of understanding the precise meaning of concepts when discussing the relationship between leadership style, innovation and organisational performance. Based on prior empirical studies reviewed in the literature, it is recommended that if the main aim is to improve organisational performance, managers should consider adopting a transformational leadership style. If the main aim is to improve organisational performance using innovation as an enabler, then managers should consider adopting both transformational and transactional leadership styles. Managers are thus encouraged to engage in transformational leadership behaviour, to act as mentor or coach to the follower and listen to the follower's concerns and needs (individual consideration), to challenge the status quo, to take risks and solicit followers' ideas (intellectual

stimulation), to articulate a vision that is inspiring to followers (inspirational motivation), to be a role model for a high ethical behaviour and to instil pride, respect and trust (idealised influence).

In **Objective 2**, the importance of creating a conducive environment for innovation to flourish is highlighted. In other words, drawing on the conclusion derived from prior studies, managers are warned that effective innovation strategy can be achieved only if a strong climate for innovation exists in the organisation. Furthermore, managers are alerted to the fact that the ability to foster an environment conducive to innovation requires top management to put mechanisms in place which allow employees to experience such a conducive environment. These include (1) establishing the appropriate reward to elicit and support innovation initiatives; (2) encouraging managerial support, demonstrating willingness, especially among upper-level executives, to facilitate and promote innovative behaviour in the organisation; (3) making resources available, including the time required to continuously engage in innovation activities; (4) creating a supportive organisational culture; and (5) creating a platform for work discretion (autonomy and risk taking), allowing employees to take risks in the pursuit of innovation and to tolerate and learn from failures.

In **Objective 3**, methods used to investigate the relationship between the set constructs were analysed. The importance of classifying innovation as radical and incremental is highlighted as critical in understanding the relationship between leadership style, innovation and organisational performance. Based on the synthesis of prior studies, innovation practitioners are urged to use both financial and non-financial measures when evaluating organisational performance. Most importantly, as it was found that prior researchers did not adhere to all aspects of the scientific research guidelines, it is recommended that researchers should provide a clear and precise description of each method sub-section of a comprehensive research report when conducting research. Researchers should ensure that they report comprehensively on research design, sampling, measurement instruments, validity and reliability, data analysis and interpretation, limitations and ethical considerations. Also, researchers are urged to take cognisance of the impact of the limitations of previous studies in future studies and make efforts to avoid them.

In **Objective 4**, the precise meaning of radical and incremental innovation is described and managers and innovation practitioners are alerted to the fact that there is no universally accepted measurement instrument to measure incremental and radical innovation. However, themes such as “new product”, “novel and revolutionary” are associated with radical innovation, whereas themes such as “improvement to existing products/processes or services” are associated with incremental innovation. As such, it is recommended that researchers should take these themes into account when developing radical and incremental innovation instruments.

In **Objective 5**, from the results in the related literature, it is found that profitability, sales growth and return on assets (ROA) are the most preferred accounting-based financial measures of organisational performance and market share; customer satisfaction and productivity are the most popular non-financial measures. These findings provide useful information for present and future researchers. When considering the standard procedures of reporting, the literature review suggests that the sole use of either financial or non-financial measures of organisational performance is not necessarily superior. No specific recommendations can be made on this aspect. However, managers and innovation practitioners are urged to clearly define which aspects of organisational performance they intend to monitor, and then report on them to ensure that their research can be incorporated into the body of knowledge. Despite the aforementioned findings that a single measure may be sufficient, the use of multiple measures is recommended to triangulate the actual outcome and to improve the quality of the research.

In **Objective 6**, the empirical investigation conducted for this study revealed that both transformational and transactional leadership styles influence innovative behaviour positively. However, in line with prior studies, the data showed that the transformational leadership style is more effective. Therefore it is recommended that managers should adopt both transformational and transactional leadership styles to improve innovation. From the transactional leadership style perspective, managers are urged to monitor and reward followers for accomplishing set goals (contingent reward) as well as monitoring deviations from what is deemed ideal (management-by-exception).

In the case of **Objective 7**, where the model was tested and presented, it was found that transactional and transformational leadership styles are related to organisational climate and organisational performance, but not directly to innovation. Thus, if the objective is to increase organisational performance using innovation as an enabler, then it is important for leaders to focus on a transformational leadership style in order to create an organisational climate that is conducive to innovation. As such, leadership development programmes should be structured in a way that develops leaders to be aware of what it means to be a transformational leader as well as understanding which elements are fundamental in creating a climate conducive to innovation.

In **Objective 8**, it was found that banks that adopted a first-mover innovation strategy outperformed banks that adopted fast-follower strategy. These results indicate that innovation is positively associated with organisational performance when using objective measures. The data also showed that the relationship between innovation strategy and organisational performance is only significant when measured by return of equity (ROE). When ROE and P/E were analysed, the results were not statistically significant. Managers are therefore encouraged to adopt a first-mover innovation strategy. Also, managers are alerted to the fact that this research revealed that innovation only influences shareholder value. It is thus recommended that managers should clearly define which aspect of organisational performance is essential to them and develop their objectives based on that. This matter, however, requires further detailed investigation.

## **10.6 Suggestions for future research**

Firstly, future researchers should consider adding complexity into the model by including more variables (i.e. other leadership styles) to the model: as reported in this study, such a strategy may yield important new findings. This will allow for gaining a more comprehensive understanding of the nature of the relationship between these constructs.

Secondly, future studies should consider longitudinal study and experimentation in order to assess if a causal relationship between these constructs exists. Quasi-experimentation design may be a practical solution to test for validity.

Thirdly, this research was largely based on perceptions. Future researchers are urged to consider using more objective measures, such as the use of patents to measure the level of innovation in the organisation.

Lastly, the empirical part of this study uses data collected from a wide range of industries. It is suggested that future studies should consider sector-specific or industry-specific data to improve the validity of the results.

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<sup>1</sup> LNG: Liquefied Natural Gas

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## APPENDIX

### Appendix for Chapter 4

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Table 4A1: EBSCOHost Databases

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Africa-Wide Information, Business Source Complete, CAB Abstracts, Communication & Mass Media Complete, Communication Abstracts, eBook Collection (EBSCOhost), EconLit with Full Text, Education Source, ERIC, Humanities & Social Sciences Index Retrospective: 1907-1984 (H.W. Wilson), Humanities Source, Library & Information Science Source, Library, Information Science & Technology Abstracts, MasterFILE Premier, PsycARTICLES, PsycBOOKS, PsycCRITIQUES, PsycEXTRA, PsycINFO, Regional Business News, Social Work Abstracts, SocINDEX with Full Text.

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Table 4A2: ProQuest Databases

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Applied Social Sciences Index and Abstracts (ASSIA) (1987-current) information, COS Scholar Universe information, ebrary® e-books information, ERIC (1966-current) information, Library and Information Science Abstracts (LISA) (1969-current) information, PAIS International (1914-current) information, ProQuest Business Collection (1951-current) information, ProQuest Central (1971-current) information, Social Services Abstracts (1979-current) information, Sociological Abstracts (1952-current) information.

Table 4A3: Summary of the findings

Article	Research design	Sampling	Validity and reliability	Measurements	Data analysis and interpretation	Limitations	Ethical considerations
1	Mixed	Not specified	Discriminant validity Cronbach Alpha>.7	LS = Adopted  Innov = Adopted  OP = Custom, Financial & Subjective	Partial Least Square (PLS) multivariate analysis technique	Lack of observation data	Not specified
2	Quant	Purposive	Discriminant validity Construct validity Cronbach Alpha>.7	OC = Adopted  Innov = Custom  OP = Custom, Financial & Subjective	Correlation Analysis	Self-reporting	Not specified
3	Quant	Purposive	Convergent validity Cronbach Alpha>.7	OC = Adopted  Innov = Adopted  OP = Custom, Financial & Subjective	Structural Equation Modelling (SEM)	<ul style="list-style-type: none"> <li>• The use of cross-sectional design</li> <li>• Time interval (snapshot)</li> <li>• Assessment of organisational climate by managers</li> </ul>	Not specified

Article	Research design	Sampling	Validity and reliability	Measurements	Data analysis and interpretation	Limitations	Ethical considerations
4	Mixed	Random	Discriminant validity Convergent validity Cronbach Alpha>.7	LS = Adopted  Innov = Adopted  OP = Custom, Financial & Subjective	Recursive non-saturated model	<ul style="list-style-type: none"> <li>• Self-reporting</li> <li>• All measures collected in the same survey</li> <li>• Focused exclusively on four sectors</li> <li>• Cross-sectional</li> <li>• Performance focused on one-dimension</li> </ul>	Not specified
5	Mixed	Random	Discriminant validity Convergent validity Cronbach Alpha>.7	LS = Adopted  Innov = Custom  OP = Custom, Financial and Non-financial & Subjective	Recursive non-saturated model	<ul style="list-style-type: none"> <li>• Self-reporting</li> <li>• Cross-sectional</li> <li>• The use of single respondent</li> <li>• Only one sector was used</li> </ul>	Not specified
6	Quant	Not specified	Discriminant validity Cronbach Alpha>.7	LS = Adopted  Innov = Adopted  OP = Adopted, Financial and Non-financial & Subjective	Structural Equation Modelling (SEM)	<ul style="list-style-type: none"> <li>• Not all dimensions of transformational leadership were tested</li> <li>• Other types of leadership style (i.e. transactional) are not included</li> <li>• Time interval (snapshot)</li> </ul>	Not specified
7	Quant	Convenient	Convergent validity Cronbach Alpha>.7	OC = Custom  Innov = Custom	Structural Equation Modelling (SEM)	<ul style="list-style-type: none"> <li>• Self-reporting</li> <li>• Time interval (snapshot)</li> <li>• Cross-sectional</li> </ul>	Not specified



Article	Research design	Sampling	Validity and reliability	Measurements	Data analysis and interpretation	Limitations	Ethical considerations
				OP = Custom, Financial & Subjective		<ul style="list-style-type: none"> <li>The use of quantitative design only</li> </ul>	
8	Quant	Purposive	Discriminant validity Cronbach Alpha>.7	LS = Adopted OC = Custom Innov = Custom OP = Custom, Non-financial & Subjective	Confirmatory Factor Analysis	<ul style="list-style-type: none"> <li>The use of same source</li> <li>Sample was small (N=35)</li> <li>Custom use of climate and performance</li> </ul>	Permission was solicited from the human resource department to conduct a study
9	Quant	Population	Discriminant validity Convergent validity Cronbach Alpha>.6	OC = Adopted Innov = Adopted OP = Custom, Financial & Subjective	Structural Equation Modelling (SEM)	<ul style="list-style-type: none"> <li>Time interval (snapshot)</li> <li>Cross-sectional</li> <li>The sole use of subjective to measure performance</li> </ul>	Permission was solicited to have access to 100 firms
10	Quant	Random and purposively	Discriminant validity Convergent validity Face Validity Cronbach Alpha>.6	LS = Adopted Innov = Adopted OP = Adopted, Financial & Subjective	Covariance-based structural equation modelling (CBSEM)	<ul style="list-style-type: none"> <li>Time interval (snapshot)</li> <li>Cross-sectional</li> </ul>	Not specified

Article	Research design	Sampling	Validity and reliability	Measurements	Data analysis and interpretation	Limitations	Ethical considerations
11	Quant	Purposive	Confirmatory factor analysis  Cronbach Alpha>.7	OC = Adopted  Innov = Adopted  OP = Custom, Financial, Subjective and Objective	Partial Least Square (PLS) multivariate analysis technique	<ul style="list-style-type: none"> <li>• Time interval (snapshot)</li> <li>• The use of PLS multivariate analysis technique for a large sample (n=35,721)</li> <li>• Only one sector was used</li> </ul>	<ul style="list-style-type: none"> <li>• Voluntarily participation</li> <li>• Anonymity</li> </ul>
12	Quant	Population	Not specified	LS = Adopted  Innov = Custom  OP = Custom, Financial, Subjective and Objective	Confirmatory Factor Analysis	<ul style="list-style-type: none"> <li>• Time interval (snapshot)</li> <li>• Smaller sample</li> </ul>	Not specified
13	Quant	Random	Confirmatory factor analysis  Cronbach Alpha>.7	LS = Adopted  Innov = Adopted  OP = Adopted, Financial and Non-financial measures & Subjective	Structural Equation Modelling (SEM)	<ul style="list-style-type: none"> <li>• Self-reporting</li> <li>• Only five sectors were used in the sample</li> <li>• Cross-sectional</li> </ul>	Not specified

Article	Research design	Sampling	Validity and reliability	Measurements	Data analysis and interpretation	Limitations	Ethical considerations
14	Quant	Random	Not specified	OC = Adopted  Innov = Adopted  OP = Adopted, Non-financial & Subjective	Multiple regression	<ul style="list-style-type: none"> <li>• Lack of corporation from other banks</li> <li>• Limited relevant literature</li> </ul>	<ul style="list-style-type: none"> <li>• Voluntarily participation</li> <li>• Anonymity</li> </ul>

Quant = Quantitative; LS = Leadership Style; OP = Organisational Performance; OC = Organisational Climate; Innov = Innovation

## Appendix for Chapter 5

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Table 5A1: EBSCOHost Databases

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Abstracts in Social Gerontology, Academic Search Premier, Africa-Wide Information, AHFS Consumer Medication Information, America: History & Life, Art Source, CAB Abstracts, Child Development & Adolescent Studies, CINAHL with Full Text, Communication & Mass Media Complete, Communication Abstracts, EconLit with Full Text, Education Source, Environment Complete, ERIC, Family & Society Studies Worldwide, Garden, Hospitality & Tourism Complete, Humanities & Social Sciences Index Retrospective: 1907–1984 (HW Wilson), Humanities Source, Index to Legal Periodicals Retrospective: 1908–1981 (HW Wilson), Inspec, Inspec Archive - Science Abstracts 1898–1968, Legal Source, LGBT Life with Full Text, Library & Information Science Source, Library, Information Science & Technology Abstracts, MasterFILE Premier, MEDLINE, Mental Measurements Yearbook with Tests in Print, New Testament Abstracts, Newspaper Source, Political Science Complete, PsycARTICLES, PsycBOOKS, PsycCRITIQUES, PsycEXTRA, PsycINFO, PsycTESTS, Race Relations Abstracts, Regional Business News, RILM Abstracts of Music Literature, Social Work Abstracts, SocINDEX with Full Text, Urban Studies Abstracts, Waters & Oceans Worldwide, Wildlife & Ecology Studies Worldwide

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Table 5A2: ProQuest Databases

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Applied Social Sciences Index and Abstracts (ASSIA)? (1987–current), COS Scholar Universe?, Design and Applied Arts Index (DAAI)? (1973–current), ebrary® e-books?, ERIC? (1966–current), Library and Information Science Abstracts (LISA)? (1969–current), MLA International Bibliography? (1926–current), National Criminal Justice Reference Service (NCJRS) Abstracts Database? (1975–current), PAIS International? (1914–current), Philosopher's Index? (1940–current), PILOTS: Published International Literature On Traumatic Stress? (1871–current), ProQuest Business Collection? (1951–current), ProQuest Central? (1971–current), ABI/INFORM Complete (1971–current), Accounting & Tax (1971–current), Banking Information Source (1971–current), Canadian Newsstand Complete, CBCA Complete, Hoover's Company Profiles, OxResearch (1986–current), Pharmaceutical News Index, ProQuest Asian Business & Reference (1971–current), ProQuest Biology

Journals (1998–current), ProQuest Career and Technical Education, ProQuest Computing (1998–current), ProQuest Criminal Justice (1981–current), ProQuest Education Journals (1988–current), ProQuest European Business (1971–current), ProQuest Family Health, ProQuest Health & Medical Complete, ProQuest Health Management, ProQuest Military Collection, ProQuest Newsstand (1984–current), ProQuest Nursing & Allied Health Source, ProQuest Political Science (1985–current), ProQuest Psychology Journals, ProQuest Religion (1986–current), ProQuest Research Library, ProQuest Science Journals, ProQuest Social Science Journals, ProQuest Sociology (1985–current), ProQuest Telecommunications (1995–current), ProQuest Dissertations & Theses: UK & Ireland?, ProQuest SciTech Collection? (1693–current), Social Services Abstracts? (1979–current), Sociological Abstracts? (1952–current), The Vogue Archive?, Worldwide Political Science Abstracts? (1975–current)

## Appendix for Chapter 6

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Table 6A1: EBSCOhost databases

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Abstracts in Social Gerontology, Academic Search Premier, Africa-Wide Information, AHFS Consumer Medication Information, America: History & Life, Art Source, ATLA Catholic Periodical and Literature Index, ATLA Religion Database with ATLASerials, Audiobook Collection (EBSCOhost), CAB Abstracts, Child Development & Adolescent Studies, CINAHL with Full Text, Communication & Mass Media Complete, Communication Abstracts, eBook Collection (EBSCOhost), EconLit with Full Text, Education Source, Environment Complete, ERIC, Family & Society Studies Worldwide, Garden, Landscape & Horticulture Index, Gender Studies Database, Global Health, GreenFILE, Health Source – Consumer Edition, Health Source: Nursing/Academic Edition, Historical Abstracts with Full Text, Hospitality & Tourism Complete, Humanities & Social Sciences Index Retrospective: 1907-1984 (H.W. Wilson), Humanities Source, Index to Legal Periodicals Retrospective: 1908-1981 (H.W. Wilson), Inspec, Inspec Archive – Science Abstracts 1898-1968, Legal Source, LGBT Life with Full Text, Library & Information Science Source, Library, Information Science & Technology Abstracts, MasterFILE Premier, MEDLINE, Mental Measurements Yearbook with Tests in Print, New Testament Abstracts, Newspaper Source, Old Testament Abstracts, Political Science Complete, PsycARTICLES, PsycBOOKS, PsycCRITIQUES, PsycEXTRA, PsycINFO, PsycTESTS, Race Relations Abstracts, Regional Business News, RILM Abstracts of Music Literature, Social Work Abstracts, SocINDEX with Full Text, Teacher Reference Center, Urban Studies Abstracts, Waters & Oceans Worldwide, Wildlife & Ecology Studies Worldwide

Table 6A2: Chronological list of articles selected for the research

Article Reference Number	Year	Author(s)	Title
1	2010	Adner & Kapoor	Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations
2	2010	Aspara, Hietanen & Tikkanen	Business model innovation vs replication: financial performance implications of strategic emphases
3	2010	Battor & Battor	The impact of customer relationship management capability on innovation and performance advantages: testing a mediated model
4	2010	Bodlaj	The impact of a responsive and proactive market orientation on innovation and business performance.
5	2010	Clifton, Keast, Pickernell & Senior	Network structure, knowledge governance, and firm performance: evidence from innovation networks and smes in the UK.
6	2010	Cortez & Cudia	The impact of environmental innovations on financial performance: the case of Japanese automotive and electronics companies
7	2010	Faems, Visser, Andries & Looy	Technology alliance portfolios and financial performance: value-enhancing and cost-increasing effects of open innovation
8	2010	Gibb & Haar	Risk taking, innovativeness and competitive rivalry: a three-way interaction towards firm performance
9	2010	Huffman & Skaggs	The effects of customer-firm interaction on innovation and performance in service firms
10	2010	Ito & Lechevalier	Why some firms persistently out-perform others: investigating the interactions between innovation and exporting strategies

Article Reference Number	Year	Author(s)	Title
11	2010	Artz, Norman, Hatfield & Cardinal	A longitudinal study of the impact of R & D, patents, and product innovation on firm performance
12	2010	Kreiser & Davis	Entrepreneurial orientation and firm performance: the unique impact of innovativeness, proactiveness, and risk-taking
13	2010	Lau, Tang & Yam	Effects of supplier and customer integration on product innovation and performance: empirical evidence in Hong Kong manufacturers
14	2010	McNally, Cavusgil & Calantone	Product innovativeness dimensions and their relationships with product advantage, product financial performance, and project protocol
15	2010	Mat-Rabi, Zulkafli & Che-Haat	Corporate governance, innovation investment and firm performance: evidence from Malaysian public listed companies
16	2010	Stegerean & Gavrea	Innovation and development – criteria for organizational performance
17	2010	Terziovski	Innovation practice and its performance implications in small and medium enterprises (smes) in the manufacturing sector: a resource-based view
18	2010	Tsai & Tsai	Innovation capability and performance in Taiwanese science parks: exploring the moderating effects of industrial clusters fabric
19	2010	Walker, Damanpour, & Devece	Management innovation and organizational performance: the mediating effect of performance management
20	2010	Wheatley & Doty	Executive compensation as a moderator of the innovation - performance relationship
21	2011	Aas & Pedersen	The impact of service innovation on firm-level financial performance



Article Reference Number	Year	Author(s)	Title
22	2011	Cainelli, Mazzanti & Zoboli	Environmentally oriented innovative strategies and firm performance in services
23	2011	Camarero, Garrido & Vicente	How cultural organizations' size and funding influence innovation and performance: the case of museums
24	2011	Cambra-Fierro, Hart, Mur & Redondo	Looking for performance: how innovation and strategy may affect market orientation models
25	2011	Cortez & Cudia	The impact of environmental innovations on financial performance: the case of Japanese automotive and electronics companies
26	2011	Fang, Palmatier & Grewal	Effects of customer and innovation asset configuration strategies on firm performance
27	2011	Forsman And Temel	Innovation and business performance in small enterprises: an enterprise-level analysis
28	2011	G€Okmen & Hamşioğlu	The effect of knowledge management, technological capability and innovation on the enterprise performance: a comprehensive empirical study of the Turkish textile sector
29	2011	Grawe, Daugherty & Roath	Knowledge synthesis and innovative logistics processes: enhancing operational flexibility and performance
30	2011	Huang, Chen, Han	The effect of business reorganization and technical innovation on firm performance
31	2011	Liu & Wu	Technology embeddedness, innovation differentiation strategies and firm performance: evidence from Chinese manufacturing firms
32	2011	Sivakumar, Roy, Zhu Hanvanich	Global innovation generation and financial performance in business-to-business relationships: the case of cross-border alliances in the pharmaceutical industry

Article Reference Number	Year	Author(s)	Title
33	2011	Song, Im, Van Der Bij & Song	Does strategic planning enhance or impede innovation and firm performance?
34	2011	Stock & Zacharias	Patterns and performance outcomes of innovation orientation
35	2011	Subrahmanya	Technological innovations and firm performance of manufacturing SMEs: determinants and outcomes
36	2011	Talke, Salomo & Kock	Top management team diversity and strategic innovation orientation: the relationship and consequences for innovativeness and performance
37	2011	Wu & Lin	The influence of innovation strategy and organizational innovation on innovation quality and performance
38	2012	Alpay, Bodur, Yilmaz, Büyükbacı	How does innovativeness yield superior firm performance? the role of marketing effectiveness
39	2012	Basterretxea & Mart'inez	Impact of management and innovation capabilities on performance: are cooperatives different
40	2012	Brockman, Jones & Becherer	Customer orientation and performance in small firms: examining the moderating influence of risk-taking, innovativeness, and opportunity focus
41	2012	Eris & Ozmen	The effect of market orientation, learning orientation and innovativeness on firm performance: a research from Turkish logistics sector
42	2012	Gronum, Verreyne & Kastle	The role of networks in small and medium-sized enterprise innovation and firm performance
43	2012	Guiral	Corporate social performance, innovation intensity, and financial performance: evidence from lending decisions

Article Reference Number	Year	Author(s)	Title
44	2012	Huang, Lai, Kao & Chen	Target costing, business model innovation, and firm performance: an empirical analysis of Chinese firms
45	2012	Mazzola, Bruccoleri & Errone	The effect of inbound, outbound and coupled innovation on performance
46	2012	Modi	Market orientation in non-profit organizations: innovativeness, resource scarcity, and performance
47	2012	Mollick	People and process, suits and innovators: the role of individuals in firm performance
48	2012	Nybakk	Learning orientation, innovativeness and financial performance in traditional manufacturing firms: a higher-order structural equation model
49	2012	Nybakk & Jenssen	Innovation strategy, working climate, and financial performance in traditional manufacturing firms: an empirical analysis
50	2012	Oke, Walumbwa & Myers	Innovation strategy, human resource policy, and firms' revenue growth: the roles of environmental uncertainty and innovation performance
51	2012	Padgett & Moura-Leite	Innovation with high social benefits and corporate financial performance
52	2012	Postružnik & Moretti	Innovation and communication as dimensions of the marketing culture: Their influence on financial performance in Slovenia's insurance and construction industries
53	2012	Ritala	Coopetition strategy – When is it successful? Empirical evidence on innovation and market performance
54	2012	Rubera & Kirca	Firm innovativeness and its performance outcomes: A meta-analytic review and theoretical integration
55	2012	Ruiz-Arroyo, Mar Fuentes-Fuentes,	Innovativeness and performance in women-owned small firms: The role of knowledge acquisition

Article Reference Number	Year	Author(s)	Title
		Bojica & Rodriguez-Ariza	
56	2013	Stock, Six & Zacharias	Linking multiple layers of innovation-oriented corporate culture, product program innovativeness, and business performance: A contingency approach
57	2013	Ndregjoni & Elmazi	The effects of relationship between information technology and firm innovation on firm performance: The case of Albani
58	2013	Bigliardi	The effect of innovation on financial performance: A research study involving SMEs innovation
59	2013	García-Zamora, González-Benito & Muñoz-Gallego	Organizational and environmental factors as moderators of the relationship between multidimensional innovation and performance
60	2013	Hemert, Nijkamp & Masurel	From innovation to commercialization through networks and agglomerations: Analysis of sources of innovation, innovation capabilities and performance of Dutch SMEs
61	2013	Iona, Leonida & Navarra	Business group affiliation, innovation, internationalization, and performance: A semi-parametric analysis
62	2013	Noruzi, Dalfard, Azhdari, Nazari-Shirkouhi & Rezazadeh	Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: An empirical investigation of manufacturing firm
63	2013	Robeson & O'connor	Boards of directors, innovation, and performance: An exploration at multiple levels
64	2013	Slavković & Babic	Global innovation generation and financial performance in business-to-business relationships: The case of cross-border alliances in the pharmaceutical industry
65	2013	Tsao & Lien	Family management and internationalization: The impact on firm performance and innovation

Article Reference Number	Year	Author(s)	Title
66	2013	Ul Hassan, Shaukat, Nawaz & Naz	Effects of innovation types on firm performance: An empirical study on Pakistan's manufacturing sector
67	2013	Yen	The impact of bank's human capital on organizational performance: How innovation influences performance
68	2013	Zhou, Hong & Liu	Internal commitment or external collaboration? The impact of human resource management systems on firm innovation and performance
69	2014	Likar, Kopac & Fatur	Innovation investment and economic performance in transition economies: Evidence from Slovenia
70	2014	Nawaz, Hassan & Shaukat	Impact of knowledge management practices on firm performance: Testing the mediation role of innovation in the manufacturing sector of Pakistan
71	2014	Yang, Yang & Chen	Effects of service innovation on financial performance of small audit firms in Taiwan